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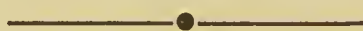
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For the convenience of the reader we have divided the indexes as follows:

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VIRTUE'S  
**HOUSEHOLD PHYSICIAN**

A TWENTIETH CENTURY MEDICAL

A PRACTICAL DESCRIPTION IN PLAIN LANGUAGE  
OF ALL THE DISEASES OF MEN, WOMEN  
AND CHILDREN

WITH THE  
LATEST DISCOVERIES IN MEDICINE AND MOST  
APPROVED METHODS OF TREATMENT. BY A  
CORPS OF EMINENT SPECIALISTS, PRACTISING  
PHYSICIANS AND SURGEONS.

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VOL. I.

ILLUSTRATED WITH MANIKINS, COLOURED AND HALF-TONE PLATES

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# PREFACE

TO THE

## Household Physician.

---

THIS book is written for the people. It is based on the assumption that every man—the mechanic, the farmer, and the day laborer, as well as the professional and business man—has a right to all the knowledge he is capable of acquiring, on all subjects, medicine not excepted. The book aims, therefore, to popularize and adapt to the many what has been claimed as belonging only to the few.

We do not hesitate to avow that our sympathies are with the great masses, who may be called the bone and muscle of the race. They are, in the main, more shrewd, more endowed with common sense, more simple and true in their natural instincts, and consequently less perverted, than many of those who claim more refinement and a higher place in the social scale.

“All men,” says Hippocrates, one of the great fathers of medicine, “ought to be acquainted with the medical art. We believe that knowledge of medicine is the sister and companion of wisdom.” Such knowledge would shield the many from the impositions of quackery. No one who reads this book thoroughly will be often imposed upon thereafter by quack nostrums, or quack doctors. Every man’s physical organization is his own; and he is charged with the responsibility of taking care of it. To do this properly, he needs knowledge of it, and to withhold this from him is another form of the old oppression, which decreed knowledge and power to the few, and ignorance and obedience to the many.

In accordance with the design of the work, it has been written in plain, simple English, and brought within the comprehension of all who have medium powers of mind.



This book was prepared by a number of Medical Experts on different diseases; the work is not a compilation, but based on large practice and wide experience. In dealing with each disease we have aimed to sketch a brief pen-and-ink portrait, so like it that every reader shall know the original whenever he sees it; we then give, in the fewest words, the best treatment.

No work of the sort has ever explained the reasons or given the whys and wherefores of medicine anything like the extent of this book, thousands of which are on their mission of instruction, and carrying comfort and relief to as many homes throughout the land.

No pecuniary effort has been spared to include every known discovery of medicine and nursing to make this book absolute perfection, and to those who make of it a careful and intelligent study, it will prove to them in value "its weight in gold."

The book is extravagantly illustrated with engravings done expressly for this work; the colored lithographs and manikins were drawn under the supervision of expert surgeons, and add much to its value.

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# GENERAL INTRODUCTORY REMARKS

---

## Progress of Medicine

MEDICINE may be divided into a science and an art. It is a science as it presents facts and evolves principles; an art as it consists of rules for practice. For its present attainments it is indebted partly to researches scientifically conducted, and partly to empirical discovery.

As a science, medicine is chiefly indebted, and must ever be, to the members of what is called the “regular profession.” This body of men embraces a large number who are alike ornaments of the race, and lights of their profession. It is to the writings of this class that every student must go who would qualify himself for the proper discharge of the duties of a physician; and he who attempts the practice of medicine without a knowledge of standard medical writings is either a fool or a knave — either without the brains to understand science, or destitute of the honesty to deal fairly with men.

**Hydropathy.** — Or the plan of treating diseases by water. The singularly careful avoidance, by the whole medical faculty, for many ages, of the article of pure water as a medicinal, or, rather, health-imparting agent, was anything but creditable.

It is now admitted by all sensible men that water, cold and warm, used at proper times and to a reasonable extent, has great power over several diseases, and is a powerful promoter of health.

**Homœopathy.** — This mode of practice is of comparatively recent origin; but it has already sunk itself deep into the popular heart, and has drawn to its support many of the wealthy, the cultivated, and the intelligent, in our most refined communities. They give



great attention to exercise, diet, etc., — which contribute very powerfully to preserve health, and to restore it when lost.

**Eclectics.** — There is a large growing class of physicians, called, at first, after the founder of the school, Thomsonians. Subsequently, they were generally known as Botanic Physicians. Now they pass under the title of Eclectics.

These men, directing their attention, at first, chiefly to cayenne and lobelia, have gradually extended their zealous researches over the vegetable kingdom, and have gathered much information worthy to be preserved.

The education and talents of this class of practitioners have gradually risen, year by year, until they have several medical schools, where students are well instructed in the principles of medicine, by men of ability. They have also good literature, especially in the department of *materia medica*. The list of remedies they have given to the world, drawn from our home plants, are of great value. We regard them as equal to all we were previously in possession of from the vegetable kingdom. The substitution of vegetable remedies, in most cases, for mercurials, cannot be too highly prized.

**Physiologists.** — Besides these various direct practitioners of medicine, there is the large and intelligent class of physiologists, including the phrenologists, who nearly discard medicine, and, appealing to the laws of life established by the Creator, urge temperance in eating and drinking; exercise in the open air; securing of pure air by ventilating dwellings, schoolhouses, and churches; bathing in cold and warm water; cheerfulness of mind; and the cultivation of the Christian virtues, as the only rational modes of securing health and life.

We confess we are inclined to forgive this class their error in banishing medicine, in view of their zeal and success in disseminating hygienic information of the utmost value and importance to mankind. Put man into harmony with nature, and establish over him the empire of reason, and their theory would be excellent; but as things are, medicines are “necessary evils.”

**Progress of Medicine.** — The art and science of medicine have made rapid progress in the last few years and are rapidly advancing.

The Chemistry of Man, commonly called Animal Chemistry, is opening new sources of light.

The result is that students have now before their minds, and are endeavoring to solve and act upon as fast as possible, inquiries and propositions like these: —

What is the chemical composition of the solids and fluids of the healthy human body?

What is the nature of the changes which occur in the composition of the solids and fluids during disease?

What alterations in the chemical composition of the solids and fluids take place during the operation of medicines?

Before it can exert any remote action on the animal economy, a remedy must be absorbed.

Before it can be absorbed, it must be soluble in the fluids of the living body.

Medicines are subject to chemical changes during their passage through the system.

These changes are regulated by ordinary chemical laws, and may, therefore, to some extent, be foretold and made available in the cure of disease.

These chemical laws are disturbed and varied, to some extent, by the law of vitality, — just as the magnetic needle is made to vary by disturbing forces.

What are these disturbances, and to what extent, and under what circumstances do they occur?

With these and similar inquiries and propositions before his mind, diligently studied, a physician can prescribe with intelligent aim. He will not know everything, to be sure, but what he does know he will have a reason for knowing. If he give a medicine, he will have in view the chemical changes of the solids and fluids of the body, known to be produced by the disease he is combating. He will also keep in mind the solution of the medicine in the fluids of the body,



and the chemical reaction between its components and the acids, alkalies, etc., found in the alimentary tube and elsewhere.

As the science of medicine advances, and becomes liberal and eclectic in its character, gathering from all systems the best attested facts — medical practitioners, who would meet the wants of the age, must be men of progress. The light of to-morrow, with them, must modify and improve the light of to-day. They must knock every hour for admission into some new apartment of nature.

**Need of Liberality.** — That medical progress may be real, physicians must be free from bigotry. They must have no narrow prejudices against any man, or class of men; but be ready to examine candidly any new thought or new remedy brought to their notice, from whatever source it may come.

**Conservative Leaders.** — There are no influences which hold so steady a check upon medical progress as the conservative leaders in many of our medical associations. These men have strong faith in caste, and in the right of the few to govern the many. In the low places of society, they look for nothing but ignorance and poverty. These are the men who regard knowledge as a contraband article. They object very strongly to the enlightenment of *all classes* in Anatomy, Hygiene, and Medicine. This prejudice should be eliminated.

**The True Physician.** — How different the character of the true man and physician. He is genial in his disposition. He has no dislikes and antipathies, and hates no men except tyrants. He accepts knowledge, though it come from the humblest source; believing there is no experience but will repay a study of it, and no husbandman's ploughshare but turns up a soil worth analyzing. He belongs exclusively to no party, and can be approached easily by respectable men of every stamp.

**What is now Wanted.** — The foregoing remarks indicate one great leading want, in order that medical knowledge may increase. It is liberality in the true and full sense. We want true men in high places, who will let their light shine everywhere.

Beyond this, and of nearly equal importance with it, we want medical knowledge diffused among the people. We want — what the world has never seen — a popular medical literature. We want the temple of Esculapius pulled down, and the priests turned into the streets to become teachers of the multitude, rather than worshippers in the inner sanctuary.

We know this want will be stoutly denied, but not, we think, on well-considered grounds. We do not think it necessary to confine a knowledge of the soul to the ministers of religion. There is no branch of theology which we do not deem it proper for laymen to study; we even popularize it for our children. In the obscurest towns, laymen who follow the plough or push the plane, become, in many cases, eminent theologians. Why should they not study the lower science which relates to the body? They have not been able to heretofore, because its mysteries have been purposely hidden under technicalities.

It is said that those who begin to read upon medicine, are very apt to imagine themselves afflicted with the various symptoms they find described. To some small extent this is true; but it is also true that the light they obtain relieves them from many apprehensions which their previous ignorance allowed to prey upon them.

Some physicians oppose the popularizing of this kind of knowledge too often, we fear, upon the sordid ground of self-interest. They think their own services will be less sought.

We do not dispense with the services of ministers because the people study theology, neither shall we cease to employ teachers and practitioners of medicine when each man and woman is wise enough to study the healing art. The principal change we shall witness will be much larger attainments in knowledge among practitioners.

The teachers of any art or science are obliged to keep in advance of their pupils. Let medicine become a popular study, and we shall have very few ignorant physicians, and quackery will become one of the impossibilities. Homœopathists, Eclectics, Hydropathists, and

Physiologists believe in scattering medical books, stripped of their technicalities, among the multitude.

This is one of the missions of this book.

How many men understand the laws of health? How many women suffer untold agony through pure ignorance of their physical construction? Children are taught history, mathematics, and other branches of learning, but know absolutely nothing of their anatomy — the function of their stomach, lungs, brain, nerves or circulation. This being the case, is it a wonder so many boys and girls enter maturity unprepared physically for the duties demanded of them, and consequently suffer for their ignorance? How different and happier would their future life be if they were to receive proper physical care and given proper instruction.

This book is written in plain English, imparting knowledge indispensable to the family, father, mother, and children, who, by taking advantage of this opportunity, by careful and intelligent study, can learn how to avoid and ward off sickness and disease, as well as to administer in case of illness to themselves and other members of the family.

But it must be borne in mind that in many cases, the services of a physician are indispensable, and unless the reader, by following the symptoms herein given, is able to diagnose the ailment, and if a marked improvement is not noticed in the patient from the remedies given, no time should be lost in calling a physician.

PHYSICIANS' PUBLISHING CO.





# WONDERS OF THE HUMAN BODY.

*In wisdom has God created us all !*

## How to Keep Well.

THE solar plexus, or brain, never ceases to operate while soul remains in the temple — never sleeps — therefore never needs to be awakened. The power — all power — given to the cerebrum and cerebellum comes from the solar center. Thus digestion of food, circulation of blood, inhaling-breathing in the aerial elements, is carried on through the wondrous mechanism of the vascular and nervous system of man's body.

The body, flesh, bone, blood, hair, nails, etc., is all that seers, philosophers, prophets, and alchemists have sought and sung throughout the centuries. But materialism forever looks away, here and there, for that which lies between the soles of man's feet and the crown of his head. In the language of Epictetus, "Unhappy man, thou carriest a god about with thee and knowest it not."

At maturity the human skeleton contains about 165 bones so delicately and perfectly adjusted that Science has despaired of ever imitating it. The muscles are about 500 in number. Length of alimentary canal 32 feet. Amount of blood in average sized adult 30 pounds, or one fifth the weight of the body.

The heart is six inches in length and four inches in diameter and beats 70 times per minute, 4200 times per hour, 100,800 per day, 36,720,000 per year; at each beat two and one-half ounces of blood are thrown out of it, 175 ounces per minute, 656 pounds every hour, or about eight tons per day. All the blood in the body passes through the heart every three minutes. During 70 years the heart lifts 270,000,000 tons.

The lungs will contain about one gallon of air at their usual inflation.

We breathe, on an average, 1,200 per hour and inhale 24,000 gallons per day.

The aggregate surface of air cells of the lungs exceeds 20,000 square inches, an area nearly equal to a room 12 feet square.

The average weight of the brain of an adult male is three pounds and eight ounces; female, two pounds and four ounces.

The female brain more than makes up in fineness of texture what it lacks in weight, compared with the male.



The nerves are all connected with the brain directly or by the spinal marrow.

The nerves, together with their branches and minute ramifications, exceed 10,000,000 in number, and form a body-guard greater than any army ever marshalled.

The skin is composed of three layers, and varies from one fourth of an inch to one inch in thickness. Its average area in an adult is estimated at 2,000 square inches. The atmospheric pressure being about 14 pounds to the square inch, a person of medium size is subject to a pressure of 40,000 pounds. Each square inch of skin contains 3,500 sweating tubes, or perspiratory pores, each of which may be likened to a little drain tile one fourth of an inch long, making an aggregate length, of all the pores placed end to end, 202,000 feet or about 40 miles.

The ashes of an average body weigh four to five pounds.

Air breathed into the arteries (air carriers — the ancients knew) unites with the cell, salts of iron, potash, lime, etc., the mineral base of blood, and is thus through the wondrous affinities and alchemical transmutations precipitated as flesh and bone by the same Infinite Intelligence that materializes vegetables, fruits, or flowers.

The organic portion of food, *i.e.*, the oil, albumen, fibrin, etc., is consumed, chemically burned in stomach and intestinal tract, to set free stored-up energy (motion) motive power to run the human machine, so the process of inhaling air — raw material for blood — may go on.

Through this chemical process of burning, called digestion, the mineral salts of iron, potassium, sodium, silica, lime, and magnesia are set free and enter the circulatory avenues through the delicate hair-like tubes that cover the mucous membrane of all internal viscera; these tubes are called absorbents. The mineral or cell salts are the foundation of blood.

Chemists now agree that there is but one substance known to man, and from it all things are made that are made.

The multiple forms of this substance constitute the visible universe.

The body of man is an epitome of the whole.

Mankind is on the verge of the discovery that the universe is a perfect machine, always in perfect order, and always running, and that all that is needed to supply man's every necessity is intelligent direction and adjustment of the machinery.

Man cannot create force — it eternally exists. Man can direct force for his benefit or pleasure just in the degree that he obtains knowledge of the nature and qualities of force.

Certainly the human body is fearfully and wonderfully made.

Children, when they reach the age of comprehension, should be taught the great importance and the wonderful working of their internal machinery, or in other words the use of their lungs, stomach,

liver, and kidneys, that they make proper use of them, thereby preserving their health, and growing to be strong men and women.

It is never too late to learn, and if you do not thoroughly understand your "internal machinery," you should certainly do so.

In the first place your external body should receive proper care. This is absolutely necessary and is the first law of health.

A sponge bath should be taken every morning; this opens the pores of the skin and allows it to throw off the poison which accumulates through the pores every twenty-four hours.

After you bathe, exercise your lungs by deep breathing. To do this, extend the hands straight in front of you, bringing them up over your head, at the same time taking a long deep breath; let the air out of your lungs slowly, as you lower your arms to your sides. Do this several times, as the average person is apt to acquire the habit of drawing the air very little into the lungs, but the fresh air should be drawn in full; way to the lower part or base of the lungs, for the blood receives the oxygen (which gives life to the blood) from the air, and to feed the blood properly, deep-drawn breaths should be taken frequently.

After this exercise drink a glass of pure fresh water, this will give you an appetite for breakfast, and before you sit down to the table just bear in mind that food is something like your coal-bin, and your stomach like your stove.

If you want a good fire in your stove you must put into it good clean wood and good coal, free from rubbish; therefore, put into your stomach proper food in a proper way, that your stomach may take good care of it, making good blood which is vitality.

Eat ripe fruit, good meat, oatmeal, eggs, etc., but never hot or soggy bread, and do not drink water with your meals; one cup of tea or coffee may be taken, but no more. Chew your food slowly and well; this causes the flow of saliva from the glands in the mouth and throat and sends the food to your stomach in proper condition for stomach and liver to take care of it.

The "liver" is the most wonderful organ of the body. All the corpuscles (solid particles in the blood) die every six weeks and have to be disposed of; the liver does most of this work, by grinding them up and working them over into something of use.

The red corpuscles have potash in them, which makes bile; this bile is a kind of lye which is a disinfectant; this passes into the small intestines and should destroy all the poisonous germs in the food before it passes into the blood.

If the liver does not do the work as it should the dead matter accumulates in the body instead of being discharged through the bowels, kidneys, and pores of the skin.

The liver is a closed door which keeps poisons out of the body. The kidneys, skin, and lungs are open doors to let the poison escape



from the body. When there comes such a pressure upon the liver from over-eating or too rich or poor food, it cannot keep the poison out, but lets it pass into the blood, so it is not purified.

This causes biliousness, a dull brain, yellow skin, dull eyes, the poison gets into the muscles, they become flabby and you feel weary and worn out. It gets into the nerves, causing sleeplessness, sciatica, and all nervous diseases. All the food taken into the stomach is filtered by the liver before it is absorbed. All impurities in food, and such as are in poor whiskey and tobacco, are filtered by the liver before passing into the general circulation; for instance, if whiskey when drank could immediately go to the brain without first being filtered through the liver, the drinker would fall dead soon after taking it.

A healthy liver full of "glycogen" (animal starch) made from the blood will destroy all poisons, but a poor and abused liver cannot do this; therefore, look well to your liver and keep it strong and healthful by good nourishing food, well cooked, well chewed, and at regular times of day for your meals.

The kidneys, as we said before, are one of the open doors through which part of the dead matter filtered through the liver is thrown out of the body through the urine (water); therefore keep the kidneys well flushed with pure water, drunk between meals, never with the meals. Every person should drink at least six glasses of water every 24 hours.

The bowels are the other open door through which the bulk of the waste matter passes from the body. They should be kept clear at regular intervals; the best time is in the morning immediately after breakfast.

As about nine tenths of the diseases flesh is heir to are caused by ignorant or wilful abuse of the stomach and liver, every person should make it their business to study themselves, their habits and appetites; and if wrong, correct them as far as possible, for good health is far better than riches.

We advise you to read carefully the chapter in this book on Anatomy and on Hygiene; it will help you to keep yourself and family well, and we cannot urge you too strenuously to study this book and make yourself familiar with it, so when sickness comes, as it surely will, you will find these articles on different diseases, which are all written by practicing physicians and specialists, will enable you to diagnose the case almost immediately, often saving long and protracted sickness and perhaps a cherished life.

We have scores of letters from fathers and mothers, even from physicians (who are strangers to us) from all parts of the country, speaking in the highest terms of this book and thanking us for the valuable advice and information received from it.

Therefore, study it; you will find it the best friend you ever had and sometime we believe you will, say as many others do, "It's worth its weight in gold."

# ANATOMY

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## Know Thyself

Every person should know themselves physically; therefore read carefully the following chapters—first, on Anatomy; second, on Hygiene—which are not only instructive, but interesting, and will assist very materially in avoiding and preventing disease.

# ANATOMY.

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ANATOMY describes the structure and organization of living beings.

Special Anatomy treats of the weight, size, shape, color, etc., of each organ separately.

General Anatomy investigates the tissues or structures from which organs are formed.

Surgical Anatomy or Regional Anatomy considers the relations of organs to one another.

Physiological Anatomy treats of the uses or functions of organs in health.

Pathological Anatomy describes the alterations made upon different organs by disease.

We shall here introduce a very brief compendium only of Special Anatomy.

It is of great consequence that every person should have some knowledge of anatomy and physiology. Self-knowledge ought to extend to the body as well as the mind. To know one's self, physically, is to gain a new insight into that wonderfully skilful adjustment of means to ends which is never absent from the works of God. Without this knowledge, one cannot know how to take care of the health; and without health, life loses most of its value.

## Structure of the Body.

THE human body is composed of solids and fluids.

The fluids are most abundant in children and youth. It is this which gives softness and pliancy to their flesh. In old age the fluids are less abundant, and the flesh is more hard and wrinkled.

The fluids contain the whole body, as it were, in a state of solution; or rather, they hold the materials out of which it is manufactured.

## Chemical Properties of the Body.

THE four elements, oxygen, hydrogen, carbon, and nitrogen, make up nearly the whole bulk of the fluids and soft solids of the human body. A number of other elements, chiefly in a state of combination, and in much smaller quantities, enter into several of the tissues.

**Binary Compounds.** — Thus, we have *carbonic acid* in blood, urine and sweat; and we have *water* universally diffused through the system, — each of these substances being a *binary* compound, that is, composed of two elements.

**Compounds of more than two Elements** are widely distributed over the body; as,



*Carbonate of Soda* in serum, saliva, bile, mucus, sweat, and tears.

*Carbonate of Lime* in cartilage, bone, and teeth.

*Phosphate of Lime* in bones, teeth, and cartilage.

*Phosphate of Iron* in blood, gastric juice, and urine.

*Chloride of Sodium* in blood, brain, muscle, bone, cartilage and pigment.

*Chloride of Potassium* in blood, gastric juice, milk, and saliva.

*Chloride of Calcium* in gastric juice.

*Sulphate of Potassa* in urine, gastric juice, and cartilage.

*Sulphate of Soda* in sweat, bile, and cartilage.

*Sulphate of Lime* in bile, hair, and scarf-skin.

*Oxide of Iron* in blood, black pigment, and hair.

**Organized Compounds.** — Besides the above inorganic elements and compounds, several organized substances, or *proximate elements*, as they are called, exist largely in the body. The chief of these are albumen, fibrin, gelatin, mucus, fat, and casein. Others need not be named.

**Albumen** is found in great abundance in the human body. It is the raw material out of which the flesh and other tissues are made. The white of an egg, which is nearly pure albumen, is a good specimen of it.

**Fibrin**, when removed from the human body, changes from a soluble to an insoluble state. In other words, it coagulates in a kind of net-work. Nearly the same thing takes place constantly in the living body, when the liquid fibrin leaves its soluble state, and is deposited as solid flesh. Fibrin bears the same relation to albumen that woolen yarn does to wool; it is spun from it in the busy wheel of organic life. And the flesh or muscle is related to fibrin as the cloth is to yarn; it is woven from it in the vital loom. Fibrin has been called *liquid flesh*.

**Gelatin** exists largely in the ligaments, cartilages, bones, skin, and cellular tissue. When dissolved, five parts in one hundred of hot water, it forms a thick jelly. *Isinglass* is a form of gelatin obtained from the air-bladder of the sturgeon and the codfish. Glue is still another form of gelatin. It is extracted from the bones, and parings of hides, and the hoofs and ears of cattle, by boiling in water. Black silk, varnished over with a solution of gelatin, forms *court-plaster*.

**Mucus** is a sticky fluid secreted by the gland-cells. It is spread over the surface of the mucous membranes, and serves to moisten and defend them from injury.

**Fat** consists of cells held together by cellular tissue and vessels, and contains glycerin, stearic acid, margaric acid, and oleic acid. It has no nitrogen. If the stearic acid be in excess, the fat is hard; if the oleic acid preponderate, it is soft. The stearine extracted from fat is used for making very hard candles.

**Casein** is abundant in milk and constitutes its curd. It is held in solution in milk by a little soda. When dried, it is cheese. It is found in blood, saliva, bile, and the lens of the eye. It forms the chief nourishment of those young animals which live on milk. It is found in peas, beans, and lentils. Vegetable and animal casein are precisely alike in all their properties. Fibrin and albumen contain almost exactly the same amount of oxygen, hydrogen, carbon, nitrogen, and sulphur, which is found in casein. This latter, when taken into the stomach, therefore, goes, without much change, to the formation of the albumen and fibrin of the body.

### Physical Properties of the Body.

**The Tissues.**—The solid organized substances of which the human body is composed, are called *tissues*. There are various kinds of tissues.

**The Cellular Tissue**, commonly called *areolar*, is made up of small fibres and bands woven together into a sort of net-work, with numerous little spaces opening into each other. These spaces are filled with a watery fluid; and when this is greatly increased by disease, so as to cause the parts to swell, and the skin to shine, the person has anasarca, or cell-dropsy. The uses of this tissue are to give parts and organs a kind of elastic cushion to rest upon, so that they may not be bruised and injured by the shocks of life; to make a kind of safe highway for delicate vessels to pass from one part of the body to another; and to furnish a beautifully arranged lodgment for the watery fluid which gives such roundness, smoothness, and grace to the human form. The opening of the cells into each other explains the reason why feeble persons have swelled feet and ankles in the evening, and not in the morning—the fluid settling down from cell to cell, into the lowest parts, while they are up during the day, and running back to its proper place while they are lying down during the night.

**The Mucous Tissue**, or *mucous membrane*, lines all the cavities which communicate with the air, as the mouth, stomach, bowels, lungs, etc. It is supplied with numerous small glands which secrete a sticky kind of fluid called mucus, to protect the surface from any injury which might be inflicted by air, or by irritating substances suspended in it.

**The Serous Tissue**, or *membrane*, lines all the cavities which do not communicate with the air, that is, all those which are shut, and have no outward opening. The skull, the chest, and the belly are lined by this kind of membrane. The membrane itself forms a closed sac,—one layer of it being attached to the cavity it lines, while the other is folded back upon and around the contents of the cavity, which are left outside of the sac. A watery fluid oozes from the inner surface of the sac, to make its sides glide easily upon each other. When some disease causes this water to be poured out too freely, so as to fill or partly fill the cavity, we have dropsy of the brain, or chest, or abdomen, as the case may be.



**The Dermoid Tissue** covers the whole outside of the body. We call it the *skin*, or *cutis*. It is similiar in structure to the mucous membranes, which are a mere continuation of it. It is harder than the mucous membrane, because more exposed to injury. In health, it never ceases to secrete and throw off a fluid which we call insensible perspiration while it is in the form of an invisible vapor, and perspiration, or sweat, when it is so increased as to be seen. So great is the sympathy between this dermoid covering of the body and the mucous membranes, that when it is *chilled* so as to stop the invisible perspiration, the internal membrane becomes affected, and we have a sore throat, or diarrhœa, or running at the nose; that is to say, when the skin cannot sweat, the mucous membrane begins to sweat.

**The Fibrous Tissue** consists of closely united fibres, and for whatever purpose used, forms a fine, dense, and enduring body. In some cases it takes the form of a membrane, as the *dura mater*, which lines the interior of the skull and spinal column. The *ligaments* which hold the bones together, and the *tendons* or *cords*, which fasten the muscles to the bones, are fibrous bodies. It is this firm substance of which rheumatism frequently takes hold, and this is the reason why it lingers so much about the joints. It sometimes takes hold of the ligament which fastens the deltoid muscle to the bone of the upper arm, about two-thirds of the way from the elbow to the shoulder. This muscle *lifts up* the arm. In this form of rheumatism, therefore, the arm hangs helpless at the side.

**The Cartilaginous Tissue** covers the ends of the bones where they come together to make a joint. It is well fitted to make the joint work easy, being smooth, hard, and elastic.

**The Osseous or Bony Tissue** varies in its composition, density, and strength, according to the age of the person, and the uses of the bone.

**The Muscular Tissue**, or *muscle*, being made for a great deal of pulling and lifting, is formed something like a rope, except that there is no twisting. Many small fibres or filaments unite to form fasciculi. A fasciculus is a bundle of fibres surrounded by a delicate layer of cell-tissue called *sarcolemma*, — just as a cord is a number of smaller threads of cotton or hemp bound together. A number of these fasciculi united together make a muscle, — just as several cords, called strands, twisted together, make a rope. Figure 1 gives us a good view of the fibres and bundles, highly magnified.

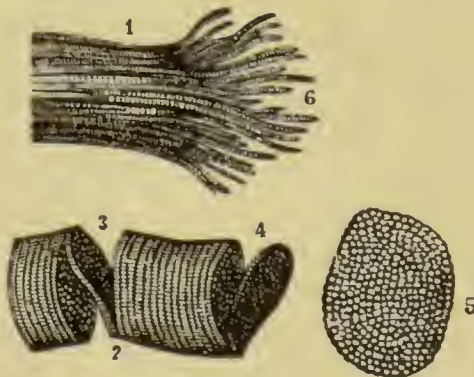


FIG. 1.

**The Adipose Tissue** is the material which the human body works up into pots and cells containing *fat*. It is found chiefly under the skin and muscles of the belly, and around the heart and kidneys. By the increase of this tissue, persons may become enormously enlarged without having their muscles at all increased in size. Such a condition is to be deplored, — the body having become merely the storehouse or depot of myriads of pots of fat.

**The Nervous Tissue** is composed of two distinct kinds of matter, — the one gray and pulpy, called *cineritious*, the other white and fibrous, called *medullary*. The external part of the brain and the internal portion of the spinal cord are composed of the gray or ash-colored tissue; the nerves are made only of the white or fibrous matter, and are inclosed in a delicate sheath called *neurilemma*.

### Vital Properties of the Body.

BODIES begin their growth with a simple *cell*, which is a delicate little bladder or shut sac. Cells take their rise in that portion of the blood which is capable of being *organized*, and which is called *blastema*.

In animal bodies each cell generally begins as a minute point in the blastema, and grows until a transparent bladder or vesicle springs out from one side of it, and soon appears to enclose it. The bladder is then called the cell, and the point or dot is its *nucleus*. Within this nucleus appears another dot, which is called the *nucleolus*. When fully ripened, the cell bursts and sets the nucleus free, and this, in its turn, matures and yields up its contents. Thus all cells have their origin in germs produced by previously existing parent-cells. They are multiplied with great rapidity. Having grown to a certain extent, they lose their fluid contents, and their walls collapsing or coming together, they form simple membraneous discs. In this way, with some variations, the simple tissues of the body begin to be, and the foundation is laid for the noble structure of man.

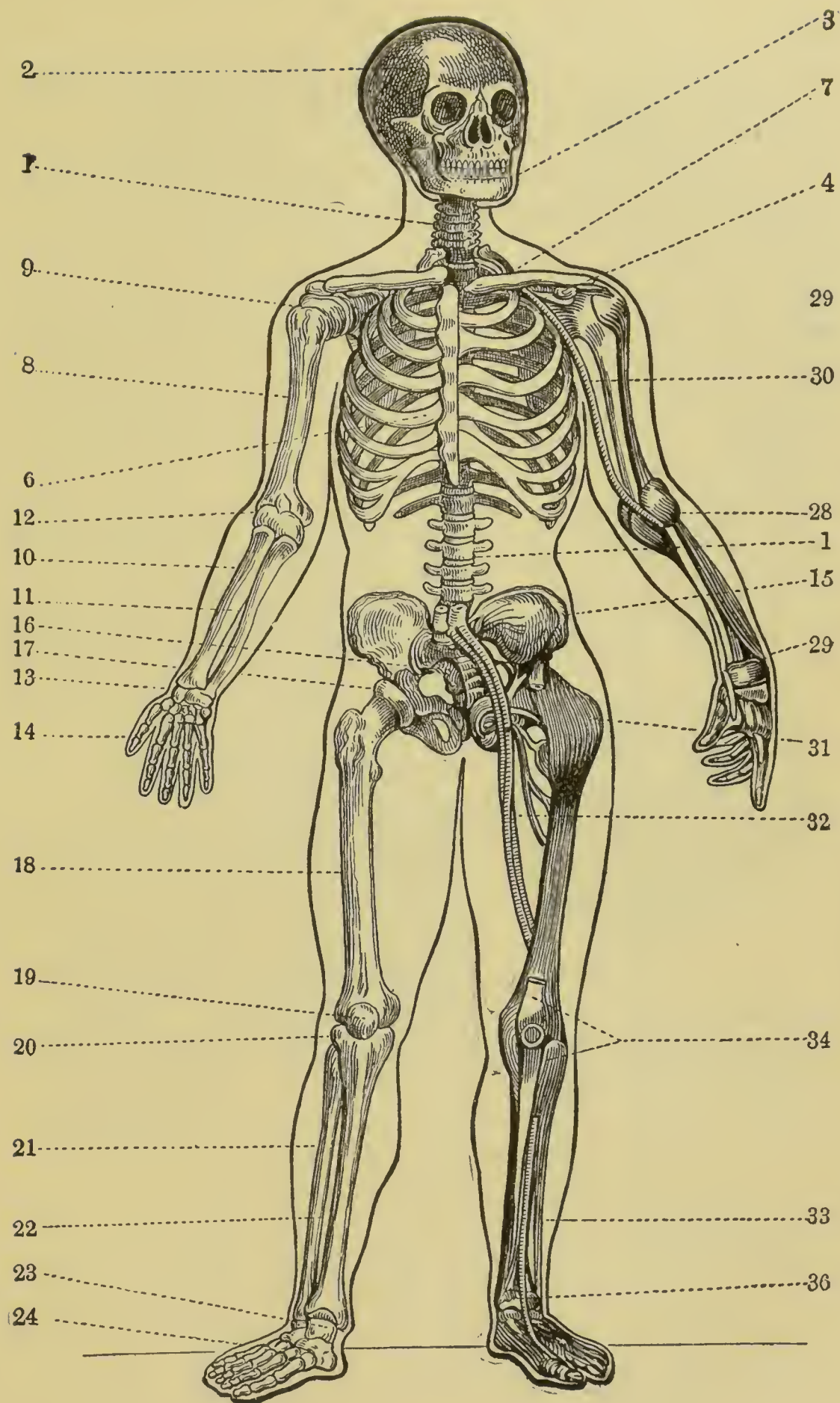
### Anatomy of the Bones.

THE human skeleton is composed of two hundred and eight bones, the teeth not included.

When fastened together by natural ligaments, the bones are said to form a *natural skeleton*; when attached by wires, an *artificial skeleton*.

In Figure 2, — 1, 1, represent the spinal column; 2, the skull; 3, the lower jaw; 4, the breast-bone (sternum); 6, the ribs; 7, the collar-bone; 8, the bone of the upper arm (humerus); 9, the shoulder-joint; 10, the radius; 11, the ulna; 12, the elbow-joint; 13, the wrist; 14, the hand; 15, the haunch-bone; 16, the sacrum; 17, the hip-joint; 18, the thigh-bone; 19, the knee-cap (patella); 20, the knee-joint; 21, the fibula; 22, the tibia; 23, ankle-joint; 24, the foot; 27, 28, 29, the ligaments of the shoulder, elbow, and wrist:







30, the large artery of the arm; 31, the ligaments of the hip-joint; 32, the large blood-vessels of the thigh; 33, the artery of the leg; 34, 35, 36, the ligaments of the knee-cap, knee, and ankle.

The protuberances or swellings in certain parts of the bones are called processes, and are the points to which muscles and ligaments are fastened.

The bones are supplied with nutritive vessels, and, like other parts of the body, are formed from the blood. At first they are comparatively soft and cartilaginous. After a time, in the young animal, they begin to change to bone at certain places, called *points of ossification*. They are covered with a strong, fibrous membrane called the *periosteum*. A somewhat similar covering upon the cartilages has the name of *perichondrium*, and that which covers the skull is the *pericranium*.

The bones are compounded of earthy and animal matter. From the former — phosphate and carbonate of lime — they receive their strength; from the latter — cartilage — they derive their life.

Put a bone for a few days into diluted muriatic acid, — one part of acid to six of water, — and the phosphate and carbonate of lime

will all be removed, while the bone will remain the same in shape. It will now be comparatively soft, and may be bent, or even tied into a knot without breaking. Place a similar bone in the fire for a few hours, and it will also retain its shape, but the cartilaginous portion will be gone. It is now brittle, and may be

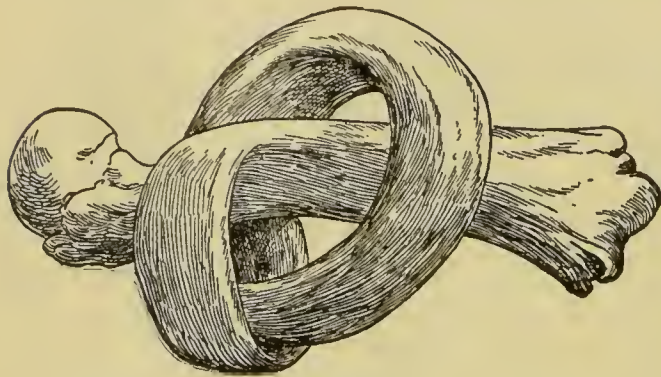


FIG. 3.

picked in pieces with the fingers.

The bones are divided into those of the head, *thirty*; of the body, *fifty-four*; of the upper limbs, *sixty-four*; and of the lower limbs, *sixty*.

### Bones of the Head.

THE bones of the head are divided into those of the *skull*, the *ear*, and the *face*.

The skull has eight bones. They are composed of two plates, one above the other, with a *porous* partition between. These two plates are capable of giving the brain very powerful protection against injury, the outer one being fibrous and *tough*, — the inner one, hard and *glass-like*, and hence called *vitreous*.

The middle layer has the name of *diploe*. Its spongy nature deadens the jar from a blow inflicted upon the outer table. In early life, when the bones are tender and yielding, this porous layer is not needed, and is not found.

That the bones of the skull may not easily slip by each other, and get out of place, they are *dovetailed* together in curious lines called *sutures*. In advanced years, these generally close up, the bones uniting firmly together. In early life they are quite open, the firm bones not covering the whole brain. The opening of the coronal suture in childhood is called a *fontanelle*. It presents a soft place upon the top of the head, where the finger could be pressed down into the brain. In Figure 4,—1, 1, show the coronal suture on the front and upper part of the skull; 2, the sagittal suture on the top of the skull; and 3, 3, the lambdoidal suture, running down on each side of the back part of the skull.

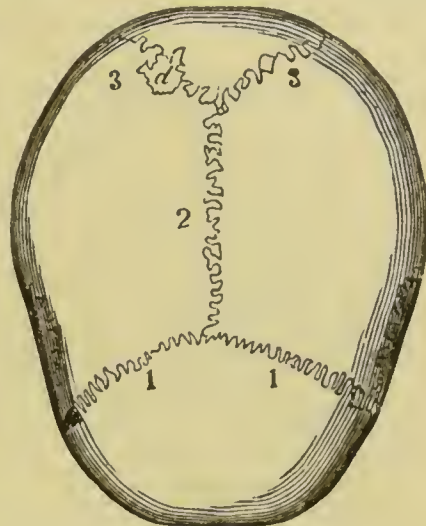


FIG. 4.

Figure 5 shows the skull-bones separated from each other at the sutures: 1, the frontal bone; 2, the parietal; 2, the occipital; 4, the temporal; 5, the nasal; 6, the malar; 7, the superior maxillary; 8,

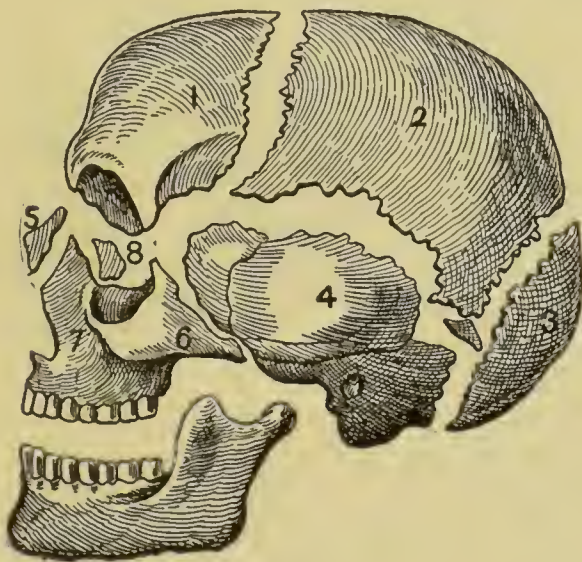


FIG. 5.

the unguis; 9, the inferior maxillary. Arnott has demonstrated that the form of the skull is the best possible for sustaining weights, and resisting blows. The summit of the head is a complete arch, like that of a bridge.

The ear has four small bones, which aid the sense of hearing.

The bones of the face are fourteen in number. They hold the soft parts in place, and aid in grinding the food.

### Bones of the Trunk.

In the trunk there are twenty-four ribs; twenty-four pieces in the backbone or spinal column; four bones in the pelvis and hips; one breast-bone, called sternum; and a bone at the base of the tongue, called os hyoides. They are so put together as to form two great cavities, namely, the thorax or chest, and the abdomen or belly.

The *ribs*, connecting with the backbone behind and the breast-bone in front, form the thorax, which contains the lungs and heart. Fig.



6 shows the natural form of the healthy chest: 1, is the spine; 2, 2, the collar-bones; 3, 3, the seven upper, or true ribs; 4, 4, the five lower or false ribs; 5, the breast-bone, to which the true ribs are

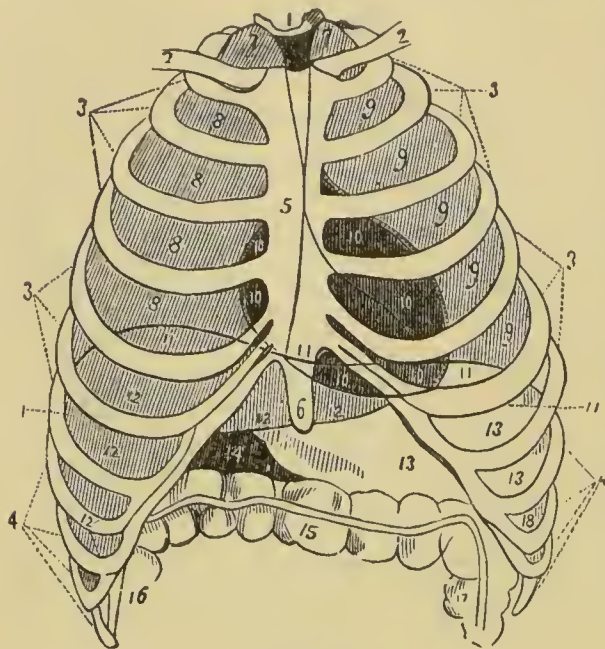


FIG. 6.

united; 6, the sword-shaped cartilage which constitutes the lower end of the breast-bone, called *ensiform cartilage*; 7, 7, the upper part of two lungs; 8, 8, the right lung, seen between the ribs; 9, 9, the left lung; 10, 10, the heart; 11, 11, the diaphragm, or midriff; 12, 12, the liver; 13, 13, the stomach, 14, 14, the second stomach, or duodenum; 15, the transverse colon; 16, the upper part of the colon on right side; 17, upper part of colon on left side.

Each piece of the spinal column is called a *vertebra*. Upon every one of these are seven

projections, called *processes*—a part of which are for linking the bones together, and the rest to furnish attachments for the muscles of the back.

The projections are linked together in such a way, that a continuous channel or opening runs down through the whole, in which is lodged the spinal cord, or *medulla spinalis*. This nervous cord is connected with the base of the brain, and is a kind of continuation of it.

Between all the *vertebræ* are certain cartilaginous cushions, which, when compressed, spring back, like India rubber, and thus protect the brain from being injuriously jarred by running, leaping, or walking.

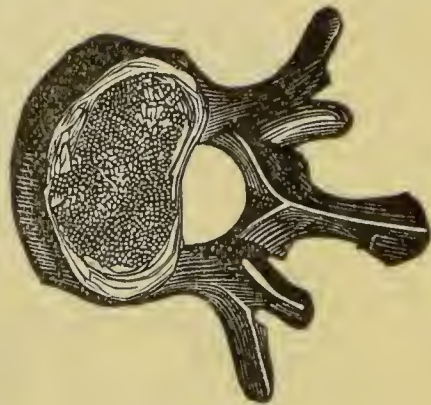


FIG. 7.

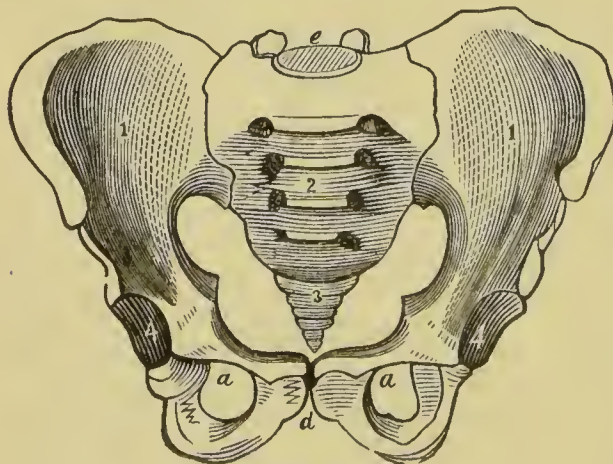


FIG. 8.

The *pelvis* has four bones: the two nameless bones — *innominata*, the *sacrum*, and the *coccyx*. In the side of each of the nameless bones is a deep, smooth cavity, called the *acetabulum*. Into this the round head of the thigh-bone is nicely fitted. When the bone is thrown out of this cavity, the hip is said to be out of joint. The *sacrum* took its name



from the fact that the heathens used to offer it in sacrifice. With them, it was the sacred bone. The coccyx is the lower termination of the backbone. These bones are represented in Fig. 8: 1, 1, being the innominate; 2, the sacrum; 3, the coccyx; 4, 4, the acetabulum: *a, a*, the pubic portion of the nameless bones; *d*, the arch of the pubes; *e*, the union of the sacrum and the lower end of the spinal column.

### Bones of the Upper Extremities.

THE *shoulder-blade* (scapula), the *collar-bone* (clavicle), the *bone of the upper arm* (humerus), the *two bones of the forearm* (ulna and radius), the *bones of the wrist* (carpal bones), the *bones of the palms of the hand* (metacarpal bones), the *bones of the thumb and fingers* (phalanges),—these are the bones of the upper limbs.

The *collar-bone* is fastened at one end to the breast-bone, at the other end to the shoulder-blade. It keeps the shoulders from dropping forward. Many persons allow it to fail of this end by getting very much bent in early life. This happens at school, when children are allowed to sit in a stooping posture. In the French, a race remarkable for a straight, upright figure, this bone is said to be longer than in any other people.

The *shoulder-blade* lies upon the upper part of the back, forming the shoulder. It has a shallow cavity (glenoid cavity), into which is inserted the head of the upper arm-bone. Several strong muscles are attached to the elevations of this bone, which keep it in its place, and move it about as circumstances require.

The *upper arm-bone* has its round head fastened in the glenoid cavity, by the strong capsular ligament, forming a joint capable of a great number of movements. At the elbow it is united with the *ulna* of the fore-arm. It is a long, cylindrical bone, represented by Fig. 9: 1, is the shaft of the bone; 2, the large, round head which fits into the glenoid cavity; 3, the surface which unites with the ulna.

Of the two bones of the fore-arm, the *ulna* is on the inner side, and unites with the humerus, making an excellent hinge-joint. The other bone of the fore-arm, the *radius*, lies on the outside of the arm,—on the same side with the thumb,—and unites, or articulates, as we say, with the bones of the wrist. In Fig. 10: 1, is the body of the ulna; 2, the shaft of the radius; 4, the articulating surface, with which the lower end of the humerus unites; 5, the upper extremity of the ulna, called the olecranon process, which forms the elbow-joint: 6, the point where the ulna articulates with the wrist.



FIG. 9.

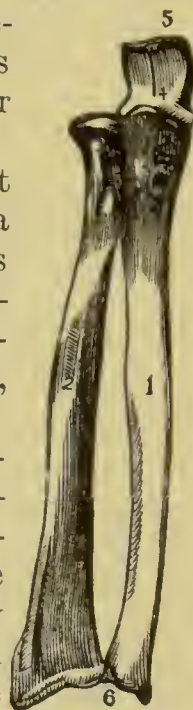


FIG. 10.

The eight bones of the *wrist* or *carpus* are ranged in two rows, and being bound close together, do not admit of very free motion. In Fig. 11: s, is the scaphoid bone; L, the semilunar bone; C, the cuneiform bone; P, the pisiform bone; T, T, the trapezium and trapezoid bones; M, the os magnum; U, the cuneiform bone. The last *four* form the second row of carpal bones. 11, 11, are the metacarpal bones of the hand; 2, 2, the first range of the finger-bones; 3, 3, the second range of finger-bones; 4, 4, the third range of finger-bones; 5, 6, the bones of the thumb.

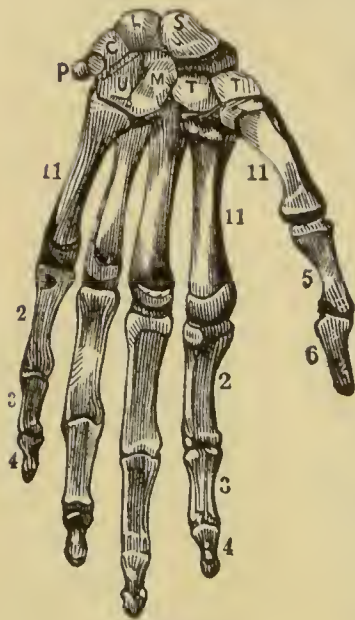


FIG. 11.

Of the five metacarpal bones, four are attached below to the first range of the finger-bones, and the other to the first bone of the thumb, while the whole are united to the second range of the carpal bones above.

### Bones of the Lower Extremities.

THESE are the *thigh-bone* (femur), the *knee-pan* (patella), the *shin-bone* (tibia), the *small bone of the leg* (fibula), the *bones of the instep* (tarsal bones), the *bones of the middle of the foot* (metatarsal bones), and the *bones of the toes* (phalanges).

The *thigh-bone* is the longest bone in the system. Its head, which is large and round, fits admirably into the cavity in the innominatum, called acetabulum, and forms what is called a ball-and-socket joint. In Fig. 12: 1, is the shaft of the thigh-bone (femur); 2, is a projection called the trochanter minor, to which some strong muscles are attached; 3, is the head of the femur, which fits into the acetabulum; 5, is the external projection of the femur, called the external condyle; 6, the internal condyle; 7, the surface which articulates with the tibia, and on which the patella slides.

The *knee-pan* or *knee-cap* (patella) is placed on the front of the knee, and being attached to the tendon of the extensor muscles above, and to the tibia by a strong ligament below, it acts as a pulley in lifting up the leg.

The *shin-bone* (tibia) is the largest of the two in the lower leg, and is considerably enlarged at each end.

The small bone of the leg (fibula) lies on the outside, and is bound to the larger bone at both ends. Fig. 13 shows the two bones of the leg: 1, being the tibia; 5, the fibula; 8, the space between the two; 6, the junction of the tibia and fibula at the upper extremity; 3, the internal ankle; 4, the lower end of the tibia that unites

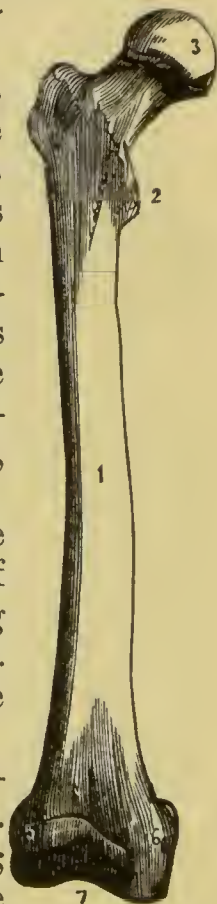


FIG. 12.



with one of the tarsal bones to form the ankle-joint; 7, the upper end of the tibia, which unites with the femur.

The *instep* (tarsus) has seven bones, which, like those of the wrist, are so firmly bound together as to allow but a limited motion.

The *metatarsal bones*, corresponding with the palm of the hand, are five in number, and unite at one end with the tarsal bones, and at the other with the first range of the toe-bones.

The tarsal and metatarsal bones are put together in the form of an *arch*, the spring of which, when the weight of the body descends upon it in walking, prevents injury to the organs above. (Fig. 14.)

The *phalanges* have fourteen bones. The great toe has two ranges

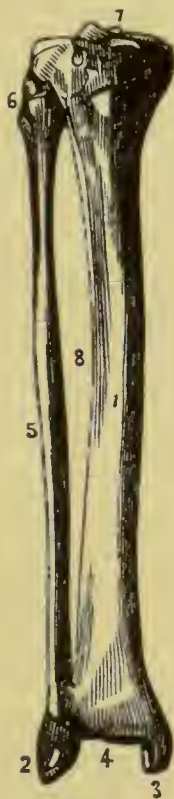


FIG. 13.

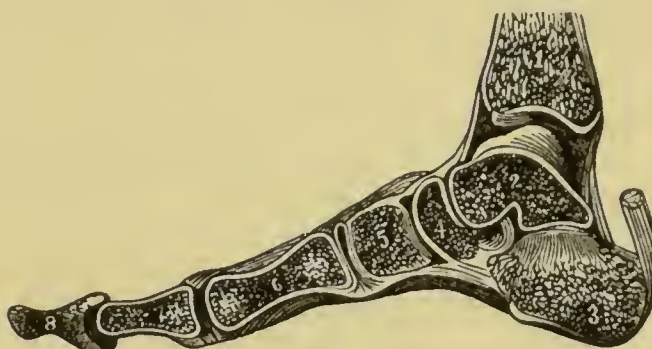


FIG. 14.

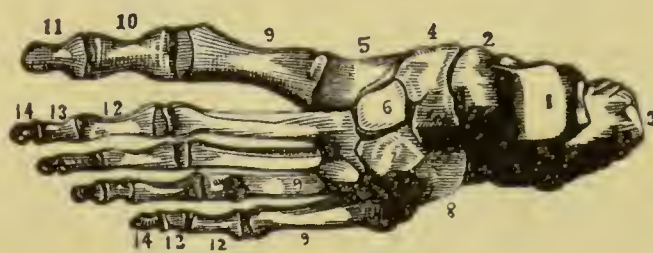


FIG. 15.

of bones; the other toes have three. Fig. 15 gives a view of the upper surface of the bones of the foot: 1, is the surface of the astragalus where it unites with the tibia; 2, the body of the astragalus; 3, the heel-bone (os calcis); 4, the scaphoid bone; 5, 6, 7, the cuneiform bones; 8, the cuboid; 9, 9, 9, the metatarsal bones; 10, the first bone of the great toe; 11, the second bone; 12, 13, 14, three ranges of bones forming the small toes.

### The Joints.

THAT bones may be of any use, they must be jointed together. Joints are of the greatest importance. It is necessary they should be so constructed that there shall be no harsh grating of the bones upon each other, and no injurious jars in walking, etc. To prevent these things, a hard, smooth, and yet yielding, cushion-like substance is



required between them in joints. Such are the *cartilages*. Fig. 16 gives a specimen of these intervening cartilages.

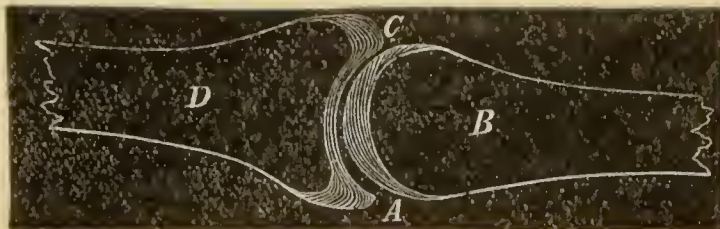


FIG. 16.

D, is the body of a bone, at the end of which is a socket; C, the cartilage lining the socket, thin at the sides and thick in the centre; B, the body of a bone, at the end of which is a

round head; C, the investing cartilage, thin at the sides and thick in the centre.

*Cartilage* grows thinner, harder, and less elastic in old age. Hence old people are not quite as tall as in middle life, and a little stiffer in their joints.

The *synovial membrane* is a thin layer covering the cartilage, and being bent back upon the inner surface of the ligaments, it forms a closed sac. From its inner surface a sticky fluid oozes out, which helps the joints to play easily.

There are other smaller sacs connected with the joints, called *bursa mucosæ*. They secrete a fluid similar to that from the synovial membrane.

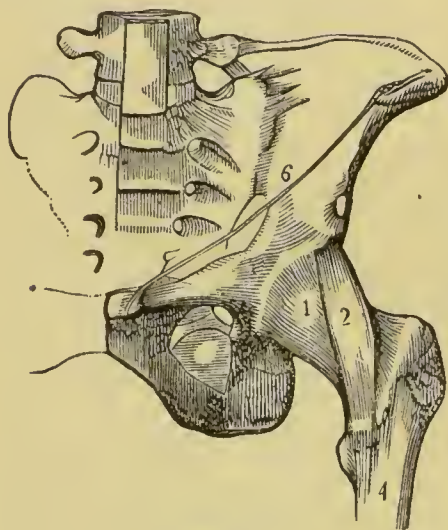


FIG. 17.

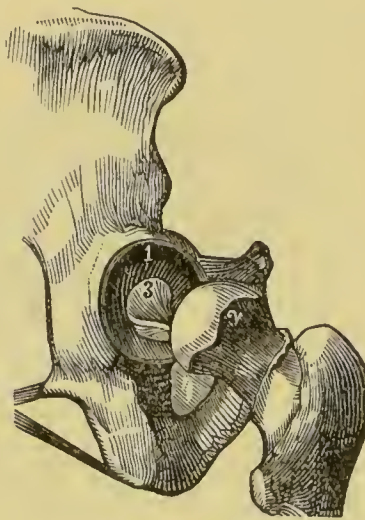


FIG. 18.

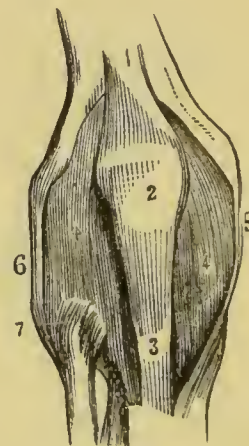


FIG. 19.

*The ligaments.* To retain the bones in their places at the joints, some strong, flexible straps are required to stretch across from one to the other, and to firmly unite them. Such are the ligaments.

They are the pearl-colored, lustrous, shining parts about the joints, in the form of straps and cords. There are a number of them so woven together as to form a complete covering of the joint, called a capsular ligament. In Fig. 17: 1, 2, are ligaments extending from the hip-bone, 6, to the femur, 4. In Fig. 18: 1, is the socket of the hip-joint; 2, head of the femur, lodged in the socket; 3, the ligament within the socket. In Fig. 19: 1, is the tendon of the muscle which extends the leg; 2, the knee-cap (patella); 3, the anterior ligament





MUSCLES OF THE HUMAN BODY



of the patella; 6, the long external lateral ligament; 4, 4, the synovial membrane; 5, the internal lateral ligament; 7, the anterior and superior ligament that unites the tibia with the fibula.

### Uses of the Bones.

THE bones are to the body what the frame is to the house. They hold up and retain the other parts in their proper places. They furnish points of attachment for the muscles, to hold the body together and to give it motion. They also furnish strong, bony cavities for the lodgment and protection of such delicate organs as the eye, the brain, and the heart.

A single bone, examined by itself, might not seem to have much beauty or design about it; it might even look clumsy and misshapen. But when all the bones are inspected with reference to each other, we immediately discover a general plan upon which they are made, and are compelled to admire their beautiful harmony, and the symmetrical grace with which they act. They show us that God can command our wonder, even in the bony frame of our bodies.

### The Muscles.

THAT part of the animal's body which we call lean meat is composed of muscles. We have already explained that muscles are composed of threads, etc., put together in great numbers, forming bundles. So numerous are these threads and bundles in some cases, that the muscles which are composed of them have a strength truly wonderful.

Toward the end of the muscle, the fibres cease, and the structure is so modified as to become a white cord of great density and strength. This cordy substance is fastened to the bone so strongly, that it is impossible, except in some rare cases, to detach it. Generally the bone will sooner break than this attachment will give way. Sometimes this cord spreads out like a membrane. It is then called *fascia* or *aponeurosis*.

The fibres of a muscle have the peculiar property of *contracting* under a nervous stimulus sent to them by the will. These contractions cause them to act as pulleys, and to move the bones, and consequently the limbs and body, in such direction as the will commands. This is the special use of the muscles. All our movements are caused by them. They pull us about, not blindly and at a random, but under the direction of an intelligent will.

The manner in which a muscle acts, with the cord attached, may be seen by examining the leg or "drum-stick" of a fowl. If the cord on one side be pulled, the claws are shut; if that upon the other side be drawn, they will open. If both be pulled, they are held fast in one position, neither opening nor shutting.

An examination of a piece of boiled lean meat will show the

threads of which it is composed. With proper instruments, these may be unravelled, as it were, until fibres will be found not larger than a spider's web. These, covered with sheaths of great delicacy, extend beyond the fleshy fibre, and with the cell-substance connecting the fibres, are condensed into tendon.

Millions of these sheathed fibres are gathered into a bundle, and covered with a sheath, and thus form what is called a *fasciculus*. A muscle is a number of these fascicula made into a bundle, and covered with a sheath called a *fascia* (Fig. 1).

The arm is a number of muscles bundled together, and covered, likewise, by a fascia.

The fibres in a fasciculus being parallel, act together. But the fasciculous bundles which make up a muscle act in various ways.

**Shape of the Muscles.** — Some muscles are fusiform or spindle-shaped, so that the attachment occupies but a small space (Fig. 20).



FIG. 20.

Other muscles are radiate or fan-shaped (Fig. 21). Such is the temporal muscle, the thin edge of which is attached to the side of the head, without producing an elevation or deformity.

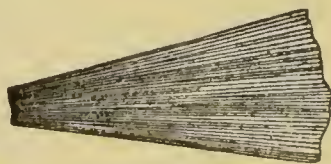


FIG. 21

In some cases the fasciculi are arranged upon one or both sides of a tendon. In this way a great number may concentrate their action upon

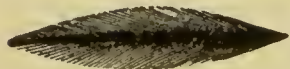


FIG. 22.

a single point. Such muscles are called *penniform*, — being shaped like a feather (Fig. 22).

In other instances, the fasciculi form circular muscles, — *orbiculares*, or *sphincters*, as they are called. These surround certain openings into the body, which they are designed to close, either in whole or in part. They surround the eyelids, the anus, the mouth of the womb, etc. (Fig. 23).



FIG. 23.

In still other instances the fasciculi are ranged side by side in rings, forming muscular tubes. By the successive contraction of these rings, any substance is driven

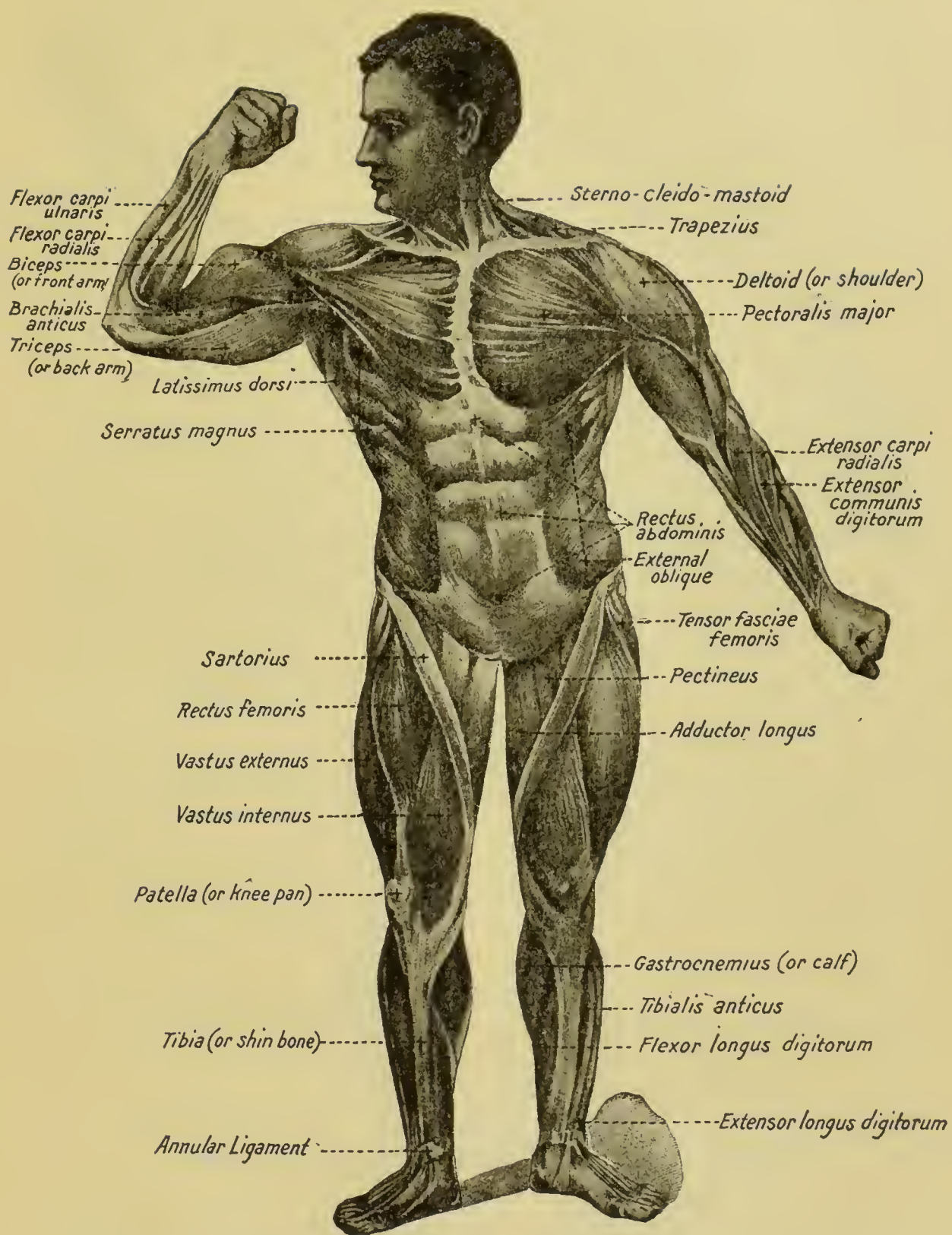


FIG. 24.

through the tube, — as food or drink through the gullet of a cow. Fig. 24 is a section of the gullet: *a*, *b*, show the circular fibres; *c*, the longitudinal.

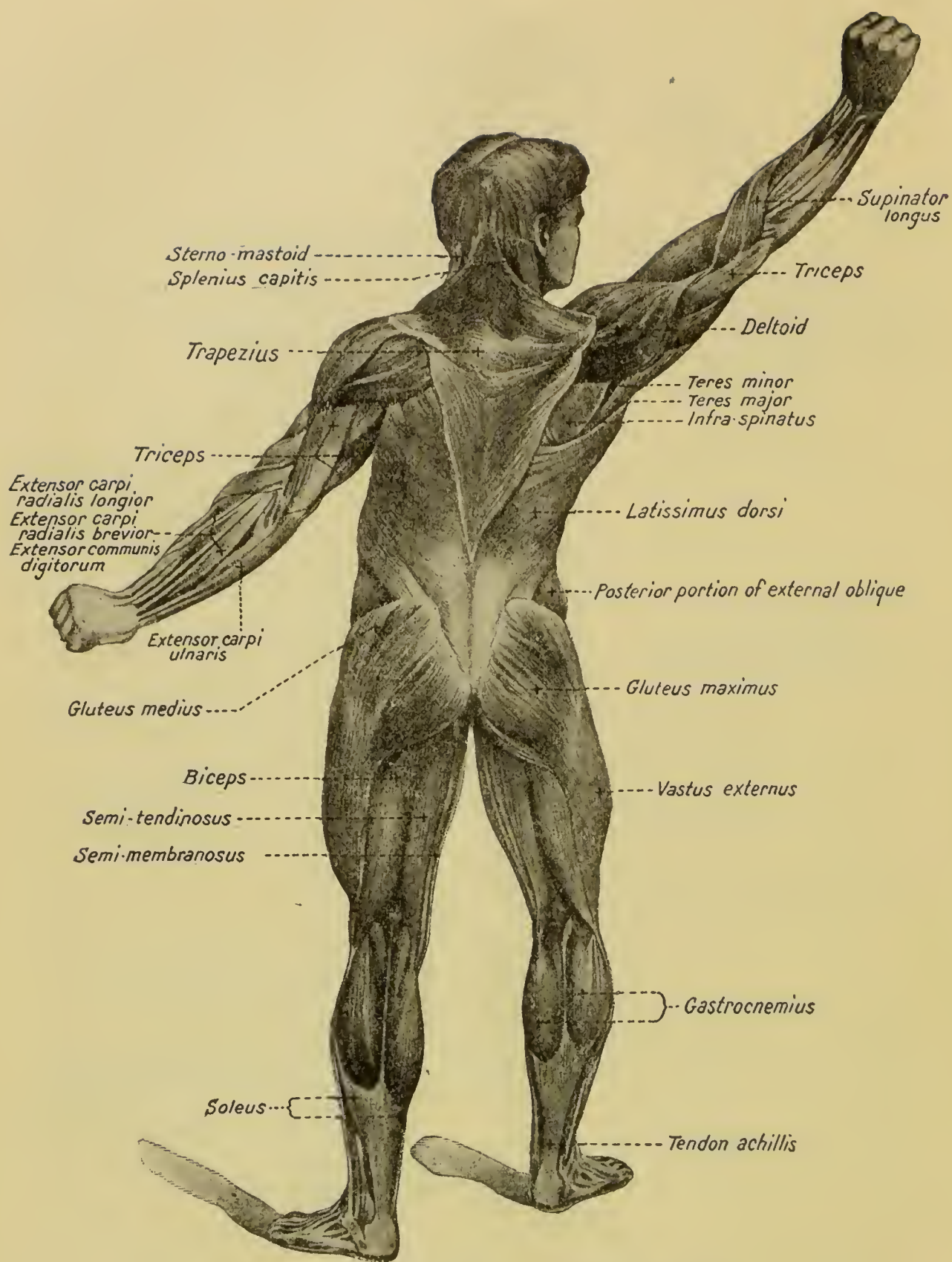
Sometimes the fasciculi curve around in parallel layers or interlace with each other, forming a bag or pouch. By the contraction of these fasciculi, the contents of the bag will be turned from side to side as in the case of the stomach, or driven out, as in that of the heart. Fig. 25 shows the muscles of the stomach: *L*, represents the fibres running in one direction; *C*, in another; *E*, lower end of gullet; *O*, pylorus; *D*, beginning of duodenum, or second stomach.





The Muscles of the Human Body.





**The Muscles of the Human Body.**

**Number of Muscles.** — The muscles of the body are as numerous as the ropes of a ship, — there being five hundred or more. Some anatomists reckon more, some less.

They are divided into those of the *head* and *neck*, those of the *trunk*, those of the *upper extremities*, and those of the *lower extremities*.

They are too numerous to be named and individually described in this brief account of them. A part of them are voluntary, that is, under the control of the will; while another part are involuntary, moving without reference to the will. The heart is of the latter kind, it being necessary for it to keep moving when the will and mind are asleep.

On the back there are six layers of muscles, one above another. Such a number are necessary to perform the numerous movements of the back, neck, arms, etc. Every expression of the human face, as joy, sorrow, love, hate, hope, fear, etc., is produced by the gentle pulling of muscles, made expressly to indicate these emotions.

The *diaphragm* is a large flat muscle, reaching across the great cavity of the body, and dividing the chest from the abdomen. It is penetrated by the gullet going to the stomach, and by the great blood-vessels leading to and from the heart. It is shaped like the cover of a dinner-dish, the convex surface being turned up. When the breath is drawn in, it sinks down towards a level, thus enlarging the chest at the expense of the belly. When the breath is thrown out, the reverse takes place.

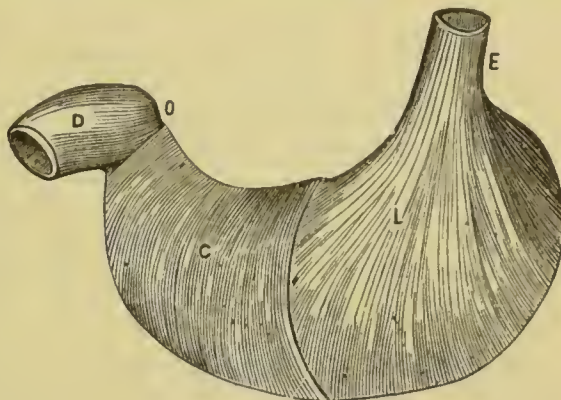


FIG. 25.

**Mode of Action.** — The *contractibility* of a muscle, of which I have spoken, is simply its power of *shortening* itself. The hand is raised

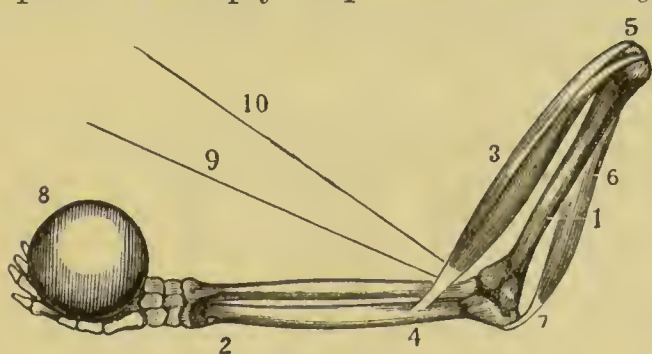


FIG. 26.

moved: 1, is the bone of the arm above the elbow; 2, one of the bones below the elbow; 3, the muscle which bends the elbow; 4, 5, attachments of muscles to bones; 6, the muscle that extends the

5 by the shortening of a muscle in front, attached to the bone above the elbow, and to a bone below the elbow. The contraction of an antagonistic muscle behind, also attached above and below the elbow, brings the hand back to its place. Fig. 26 shows how all joints are



elbow; 7, attachment to elbow; 8, weight in hand. The muscle, 3, contracts at the central part, and brings the hand up to 9, 10.

The complication, variety, and swiftness of motion, executed by muscles, are past conception. Every movement which a human being makes, from the heavier motions of the farmer in cultivating his fields, up to the magic touches of the painter's brush, and the methodical frenzy with which the great master's fingers sweep the piano, are all made by muscles obeying an intelligent will.

## The Teeth.

THE teeth are not like other bones, either in composition, method of nutrition, or growth. When broken they do not unite, not being furnished with the necessary power of reproduction of lost parts.

Both the upper and lower teeth are set into bony sockets, called alveolar processes. These, with the fibrous gums, give the teeth a very firm setting.

**Origin.**—The teeth have their origin in little membranous pouches within the bone of the jaw, which, in their interior, have a fleshy bud. From the surface of this the bone or ivory exudes. The tooth and the bony socket are developed and rise up together, — the former, when sufficiently long, pushing itself through the gum.

**Number.**—The first set of teeth are only temporary, and are called *milk-teeth*. There are but twenty of them. Between the age of six and fourteen, these become loose, and drop out, and the permanent teeth appear in their places. Of these there are thirty-two, sixteen in each jaw.

**Names.**—The four front teeth in each jaw, *a, b*, Fig. 27, are the *cutting teeth* (incisors); the next one, *c*, is an *eye-tooth* (cuspid); the

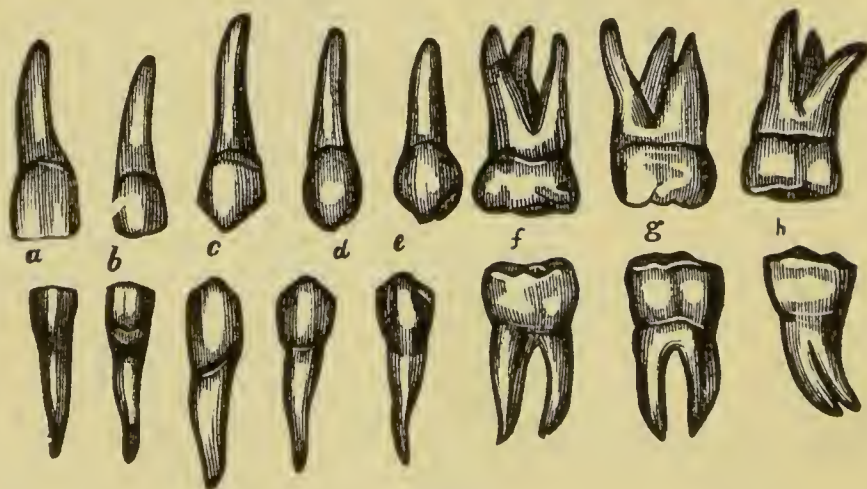


Fig. 27.

next two, *d, e*, are *small grinders* (bicuspid); the last three, *f, g, h*, are *grinders* (molars). One appears late on each side, from the age of twenty to twenty-four, and is called *wisdom tooth*.



**Composition.**—A tooth is composed of *ivory* and enamel. The internal part is ivory, which is harder than bone. The coating upon the surface is *enamel*, which is still harder than ivory. That part which rises above the jaw-bone is called the *crown*; it is this only which is covered with enamel. The part within the jaw is called the *root* or *fang*; this is composed of bony matter, through which small vessels pass in to nourish the tooth. Small white nerves also pass into the tooth, — of the presence of which we have terrible evidence in tooth-ache.

### Use of the Teeth.

THE incisors cut the food asunder; the molars break down its solid parts, and grind it to a fineness which fits it for the stomach.

In masticating the food, the lower jaw has two movements, the up-and-down motion, like a pair of shears, and the lateral or grinding motion. These two movements are performed by different sets of muscles. Flesh-eating animals have only the up-and-down motion; vegetable-eating animals have only the lateral or grinding motion; while man has both the up-and-down and the lateral. This seems a pretty clear intimation that he is to eat both flesh and vegetables.

The teeth aid us in articulating words, and they give a roundness and symmetry to the lower part of the face. When well formed, and kept in good condition, they add much to the beauty of the face, and their decay is an irreparable loss. Their proper care and treatment are spoken of in another place.

### The Digestive Organs.

THE alimentary organs are the mouth, the teeth, the salivary glands, the pharynx, the gullet (œsophagus), stomach, bowels (intestines), chyle vessels (lacteals), thoracic duct, liver and sweetbread (pancreas).

The preparatory process of digestion, the mastication of food, takes place in the mouth, where the food is mixed with saliva, a secretion of the salivary glands. Of these glands there are six, three on each side.

**The Parotid Gland** lies in front of the external ear. It has a duct opening into the mouth opposite the second molar tooth of the upper jaw. This is the gland that swells in the disease called mumps. Hence the disease is also called *parotitis*.

**The Submaxillary Gland** is inclosed within the lower jaw, in front of its angle. Its duct opens into the mouth by the side of the bridle of the tongue (*frænum linguæ*).

On each side of this string or bridle, and under the mucous membrane of the floor of the mouth, lies the *sublingual gland*, which pours its saliva into the mouth, through seven or eight small ducts

A disease called the *frog* consists in the swelling of this gland. Fig. 28: 1, the parotid gland; 2, its duct; 3, the submaxillary; 4, its duct; 5, the sublingual.



FIG. 28.

4, 4, 4, muscles of pharynx; 5, muscles of the cheek; 6, the muscle which surrounds the mouth; 7, the muscle forming the floor of the mouth.

**The Gullet** or *œsophagus* is a long tube, descending behind the windpipe, the lungs, and the heart, through the diaphragm into the stomach. It is composed of two membranes laid together, like two pieces of cloth. The inner one is mucous, the outer muscular. The two sets of fibres composing the muscular coat are arranged circularly and longitudinally (Fig. 25).

**The Stomach** lies in the upper part of the belly, to the left, and directly under the diaphragm. It has an upper opening, where the stomach-pipe enters it, called the *cardiac orifice*. This is the larger end of the stomach, and lies on the left side; the smaller end connects with the upper bowel, at which point it has an opening called the *pyloric orifice*. In addition to mucous and muscular coats, similar to those which compose the *œsophagus*, the stomach has still another over both, a *serous coat*, very strong and tough, to give this working organ additional endurance. Within, it has many glands to secrete the gastric juice.

**The Intestines**, or *alimentary tube*, or *bowels*, are divided into the *small* and *large* intestines.

The small intestine has a length of about twenty-five feet, and is divided into three parts, — the *duodenum*, the *jejunum*, and the *ileum*.

Of these three divisions, the *duodenum* is the largest, and is about

**The Pharynx** is a continuation of the mouth, and is the cavity just below the soft palate. The two passages going to the nose (posterior nares), the one going to the stomach (*œsophagus*), and the one going to the lungs (larynx and trachea; all meet in this cavity. In Fig. 29: 1, is the trachea; 2, the larynx; 3, the *œsophagus*;

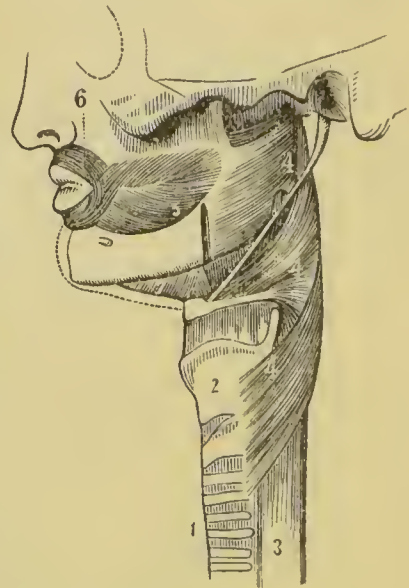


FIG. 29.



a foot in length. It begins at the pyloric orifice of the stomach, and passes backward to the under surface of the liver, whence it drops down perpendicularly in front of the right kidney, and passes across the belly behind the colon, and ends in the *jejunum*.

**The Jejunum** continues the above, and terminates in the *ileum*.

**The Ileum** is a continuation of the *jejunum*, and opens, at an obtuse angle, near the haunch bone, into the *colon*. A valve is located here, to prevent the backward passage of substances from the colon into the ileum.

At this point the large intestines begin, and here is situated the *cæcum*, a blind pouch, or cul-de-sac, attached to which is the *appendix vermiformis*, a worm-shaped tube, of the size of a goose-quill, and from one to six inches long.

**The Colon**, or large intestine, is divided into the *ascending colon*, the *transverse colon*, and the *descending colon*.

**The Ascending Colon** rises from the right haunch-bone to the under surface of the liver, whence it bends inward, and crosses the upper part of the belly, below the liver and stomach, to the left side. This portion which crosses over is the *transverse colon*. From this point, on the left side, it turns down to the left haunch, and has the name of the *descending colon*. Here it makes a curve like the letter S, which is called the *sigmoid flexure*.

**The Rectum** is the lower portion of the large intestine, terminating at the anus.

**The Lacteals** are small vessels which begin in the villi, upon the mucous membrane of the small bowels. From here they pass between membranes of the *mesentery* to small glands, from which larger vessels run to another collection of glands; and after passing, for a space, from one collection of glands to another, at each stage of their progress increased in size and diminished in number, the lacteals pour their contents into the *thoracic duct*. This having passed up through the diaphragm, out of the belly, makes a sudden turn downward and forward, and empties its burden into a large vein which ends in the right heart. Fig. 30: 1, is the bowel; 2, 3, 4, the mesenteric glands through which the lacteals pass; 5, the thoracic duct; 7, the spinal column; 8, the diaphragm.

By the help of a magnifying glass, an infinite number of these small vessels may be seen starting from the rough, shaggy internal coat of the bowel.

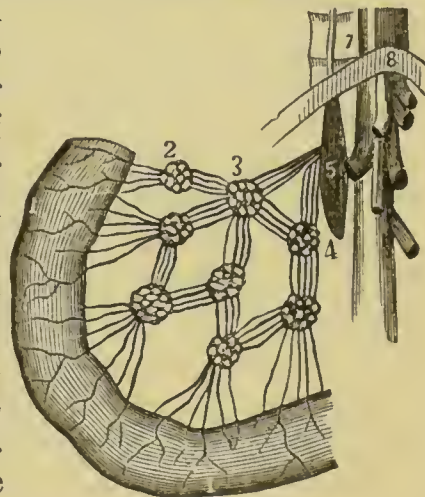


FIG. 30.



The *mesentery* is a thick sheet of membrane, formed of several folds of the peritoneum, and spread out from the vertebræ like a fan. The bowels are attached to its edge, and are held by it in their place, and at the same time have free motion. Between its layers are a great number of glands, which sometimes become diseased and swollen in childhood, and prevent the chyle from passing along to the thoracic duct. Thus affected, children are not nourished, and waste away with a disease sometimes called mesenteric consumption.

**The Liver** is a large gland, lying under the short ribs on the right side, below the diaphragm. It is convex on the upper surface and

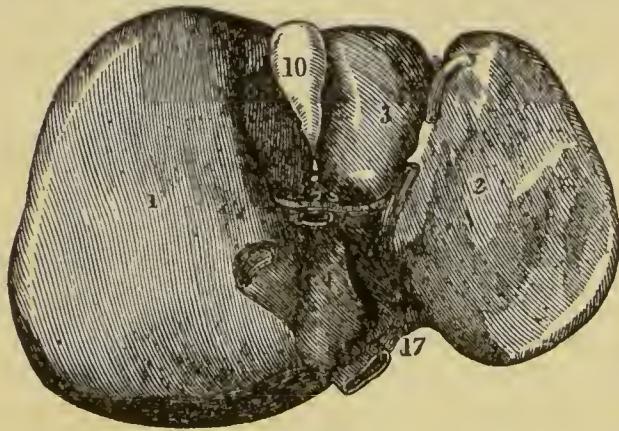


FIG. 31.

concave on the under, and is composed of several lobes. Its office is to secrete bile. It weighs about four pounds, being the largest organ in the body. Fig. 31 represents the liver: 1, being the right lobe; 2, left lobe; 3, 4, smaller lobes; 10, gall-bladder; 17, the notch into which the spinal column is fitted.

**The Gall-Bladder** lies on the under side of the liver, and receives, it is supposed, the surplus bile, which is reserved for special occasions. It opens into the gall-duct, which carries the bile along, and pours it into the duodenum.

**The Pancreas**, Fig. 32, is a long, flat gland, something like the salivary glands. It lies transversely across the back wall of the abdomen, behind the stomach. It secretes a colorless, alkaline fluid called the *pancreatic juice*, the office of which is to emulsify the different classes of food, so that the lacteals can absorb it. This fluid is carried by a duct, and poured into the duodenum just where the bile-duct enters.

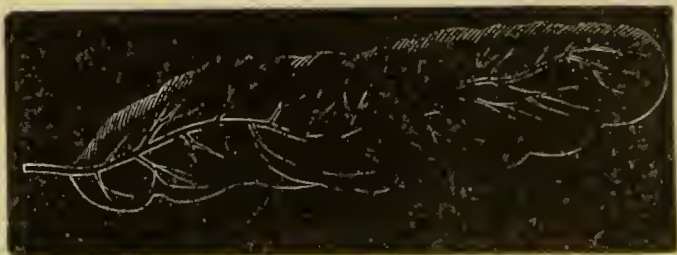


FIG. 32.

**The Spleen** has an oblong, flattened form. It lies on the left side, just under the diaphragm, and close to the stomach and pancreas. It is supposed to be a reservoir for holding the surplus blood of the liver. It was thought by the ancients to be the seat of melancholy. The blood in passing through it loses a portion of its red globules.

**The Omentum** or *caul* is a doubling and extension of the peritoneum. It is a kind of fatty body, which lies upon the surface of the

bowels and is attached to the stomach. Its use seems to be to lubricate the bowels, and especially to protect and keep them warm. Hence it is often called the *apron*.

## The Urinary System.

THE organs of this system are devoted to separating the urine from the blood, and carrying it out of the body. These organs are the *kidneys*, the *ureters*, the *bladder*, and the *urethra*.

**The Kidneys** lie one on each side of the backbone, in the lumbar region, behind the peritoneum. They are four or five inches long, and two and a half broad. They are in shape like the kidney-bean, and weigh about half a pound each. In the centre there is a bag called the pelvis, which tapers like a funnel, and unites with the ureter which conveys the urine to the bladder. The texture of the kidney is dense, presenting in its interior two structures, an external or cortical, and an internal or medullary. The cortical portion has the blood-vessels, the medullary is composed of tubes which carry away the urine.

**The Ureters** are membranous tubes of the size of a goose-quill, and eighteen inches long, which run down the back wall of the abdomen, behind the peritoneum, to the bladder, into each side of which they empty their contents.

**The Bladder** is located in the pelvis, in front of the *rectum*. It is composed of three coats; the external is serous, the middle muscular, and the internal mucous. The external coat is strong and fibrous; the internal is drawn into wrinkles, which makes it thick and shaggy; it secretes a mucus which prevents it from being injured by the corrosiveness of the urine. The urine is retained in the bladder by means of a circular muscle, called a *sphincter*, which draws the mouth of the organ together. When the quantity of urine is so increased as to give some uneasiness or pain, this muscle, by a sort of instinct, relaxes and lets it out.

The bladder is attached to the rectum, to the hip-bones, to the peritoneum, and to the navel, by several ligaments. In the female the bladder has the womb between it and the rectum.

This organ is wisely provided as a receptacle for the urine; which, without it, would produce a great inconvenience by being constantly dribbling away.

**The Urethra** is a membranous canal which leads from the neck of the bladder. It is composed of two layers, a mucous and an elastic fibrous. Through this channel, which is curved in its course, the urine passes out of the body.



## The Respiratory Organs.

THESE organs consist of the *windpipe* (trachea); *divisions and subdivisions of the windpipe* (bronchia); *air-cells*; and the *lungs* or *lights*.

**The Windpipe** (trachea) extends from the *larynx*—the seat of the voice—to the third dorsal vertebra, where it divides into two tubes, called bronchia. It runs down the front part of the throat, with the œsophagus behind and between it and the spinal column. It is composed mainly of rings of cartilage, one above another.

**The Bronchial Tubes** are, at the division of the windpipe, two in number, but they divide and subdivide until they become very numerous.

**The Air-Cells or Vesicles** are small, bladder-like expansions at the ends of the tubes. They are elastic and swell out when the air passes in.

**The Lungs** fill the greater part of the chest, the heart being the only other organ which occupies much space in the cavity. The size of these organs is large or small, according to the capacity of the chest. Each lung — for there are two — is a kind of cone, with its base resting upon the diaphragm, and its apex behind the collar-bone. They are concave on the bottom, to fit the diaphragm, which is convex on its upper side.

The right and left lungs are separated from each other by a partition called the *mediastinum*, formed by two portions of the pleura, a smooth serous membrane coming off from the spine and closely enveloping each lung; the heart, covered by the pericardium, lies in the centre, between them. The right lung is divided into three lobes; the left into two.

Each lobe of the lungs is divided into a great many *lobules*, which are connected by cellular tissue. These lobules are again divided into very fine air-cells. Besides these, the substance of the lungs is composed likewise of blood-vessels and lymphatics, and is well supplied with nerves.

In the foetal state, before the lungs have been filled with air, they are solid and heavy, something like other flesh, but after all their cells have been filled with air, and breathing has been established, they are exceedingly light and spongy, and float upon water.

In cases where infanticide is suspected, and where it is desirable to know whether the child was *still-born*, or born alive and killed afterwards, the specific gravity of the lungs, compared with water, will often settle the question.



## The Organs of Circulation.

THE food having been digested, changed to chyle, absorbed by the lacteals, carried to the veins, poured into the right heart, sent up to the lungs, and prepared for nourishing the body, will still be useless, if not distributed to every part of the system. The organs for effecting this distribution are the *heart*, the *arteries*, the *veins*, and the *capillaries*.

**The Heart** is placed obliquely in the chest, with one lung on each side, and is enclosed between the two folds of the mediastinum. Its form is something like a cone. Its base is turned upward and backward in the direction of the right shoulder; the apex forward and to the left, occupying the space between the fifth and sixth ribs, about three inches from the breast-bone. It is surrounded by a membranous case or sac, called the *pericardium*.

The heart is a muscular body, and has its fibres so interwoven that it is endowed with great strength. It is a double organ, having two sides, a right and a left, which are divided from each other by a muscular partition, called a septum. The right heart sends the blood to the lungs; the left heart distributes it to the general system. Each side is divided into two compartments, an auricle and a ventricle.

**The Auricles** have thinner walls than the ventricles, being only reservoirs to hold the blood until the *ventricles* force it along to other parts.

**The Ventricles** have within them fleshy columns, called *columnæ carneæ*. The walls of the left ventricle are thicker than those of the right, being required to contract with more force. Each of the four cavities will contain from one and a half to two ounces of blood.

**The Tricuspid** valves are situated between the auricle and ventricle on the right side, and consist of three folds of a thin, triangular membrane. The *mitral* valves occupy the same position on the left side. Small white cords, called *chordæ tendinæ*, pass from the floating edge of these to the *columnæ carneæ*, to prevent the backward pressure of the blood from carrying the valves into the auricles.

The *pulmonary artery* is\* the outlet of the right ventricle; the larger artery, called *aorta*, of the left ventricle. At the opening of these arteries are membranous folds, called *semilunar valves*. Fig. 33 gives a fine view of the heart: 1. is the right auricle; 2. the left auricle; 3, the right ventricle; 4, the left ventricle; 5, 6, 7, 8, 9, 10, the vessels which bring the blood to and carry it away from the heart.

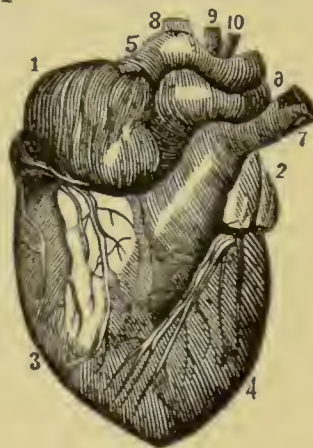


FIG. 33.

**The Arteries** are the round tubes which carry the red blood from the left side of the heart to every part of the body.

The sides of arteries are stiff and hard, and do not fall together when empty. They may often be seen open in a piece of boiled beef.

The arteries have three coats,—an external, which is cellular, firm and strong; a middle, which is fibrous and elastic; and an internal, which is serous and smooth, being a continuation of the lining of the heart. They are surrounded by a cell vestment called a *sheath*, which separates them from surrounding organs.

**The Pulmonary Artery** starts from the right ventricle in front of the opening of the aorta, and ascends to the under surface of the aortic arch, where it parts into two branches, sending one to the right, the other to the left lung. Having divided and subdivided to a great extent, they end in the capillary vessels, uniting, joining their mouths, and becoming continuous with the pulmonary veins just where they pass around the air-cells.

**The Aorta** is the largest artery in the body. It takes a slight turn in the chest, called the *arch of the aorta*, from which are given off the arteries which carry the blood to the head, etc.; thence it descends into the belly along the side of the backbone, and at the bottom of the abdomen it divides into two arteries, called the *iliacs* — one going to each of the lower limbs. The branches the aorta gives off a supply of red blood to every part of the body.

**The Veins** carry the dark or purple blood. Being made red and vital by meeting atmospheric air in the lungs, and then conveyed to every part of the body in the arteries, the blood loses its redness in the capillaries, and comes back to the heart in the veins, dark and purple, and unfit to support life. The veins are more numerous and nearer the surface than the arteries. They have, likewise, thinner walls, and when empty, they collapse or fall together. They begin in the small capillaries, and running together, they grow larger and larger, and finally form the great trunks which pour the dark blood into the right auricle. The veins are composed of three coats, similar to those of the arteries, with the exception of being thinner and more delicate. These vessels have valves all along their inner surface, to aid in circulating the blood.

The large vein which receives all the dark blood from above, and pours it into the right auricle, is called the *vena cava descendens*; the one which takes it from below, and disposes of it in the same manner, is the *vena cava ascendens*.

The pulmonary veins bring the *red* blood from the lungs to the *left* auricle, and thus are exceptional in their use, — being the only veins which carry red blood.

**The Capillaries** are the extremely fine network of vessels between the ends of the arteries on the one side, and of the veins on the other.



They inosculate, or join their mouths to the very small arteries at one end, and to the equally small veins at the other. They are the industrious little builders of the human frame. Receiving the blood, red, and full of life, from the terminal extremities of the arteries, they take the living particles out of it, and apply them to the renewing and vitalizing of the body, and then pass it along into the hair-like beginnings of the veins, dark and bereft of vitality, to be carried up for another freight of chyle, and to be again vitalized by being touched in the lungs by the breath of heaven.

In Fig. 34 we have a good ideal illustration of the whole circulation. From the right ventricle of the heart, 2, the dark blood is

thrown into the pulmonary artery, 3, and its branches, 4, 4, carry it to both lungs. In the capillary vessels, 6, 6, the blood comes in contact with the air, and becomes red and vitalized. Thence it is returned to the left auricle of the heart, 9, by the veins, 7, 8. Thence it passes into the left ventricle, 10. A forcible contraction of this sends it forward into the aorta, 11. Its branches, 12, 13, 13, distribute it to all parts of the body. The arteries terminate in the capillaries, 14, 14. Here the blood loses its redness, and goes back to the right auricle, 1, by the vena cava descendens, 15, and the vena cava ascendens, 16. The tricuspid valves, 17, prevent the reflow of the blood from the right ventricle to the right auricle. The semilunar valves, 18, prevent the blood from passing back from the pulmonary artery to the right ventricle. The mitral valves, 19, prevent its being forced back from the left ventricle to the left auricle. The semilunar valves, 20, prevent the backward flow from the aorta to the left ventricle.

By a careful examination of this diagram, with these explanations, the reader may understand the circulation very well.

The passage of the blood from the right heart, through the lungs, and back to the left heart, is called the *lesser*, or *pulmonic circulation*; its passage from the left heart through all parts of the body, and back to the right heart, is the *greater* or *systematic circulation*.

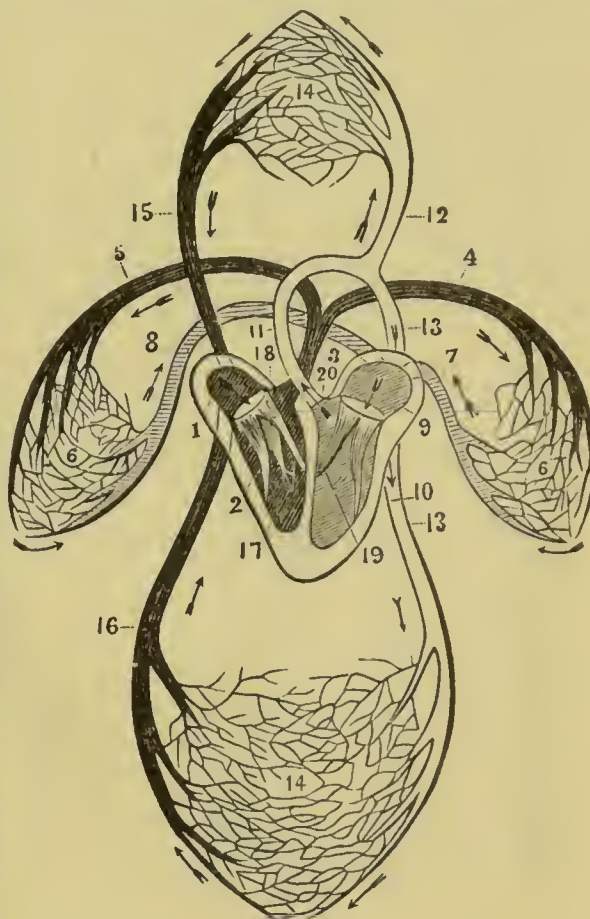


FIG. 34.

## The Absorbent Vessels.

THE vessels which absorb the chyle from the small intestines, and convey it onward towards the blood, are the *lacteals*. They have been described. The veins are also supposed to have the power of absorption, particularly the small commencements of the veins. These have likewise been described.



FIG. 35.

**The Lymphatic** vessels resemble the lacteals. They abound in the skin, the mucous membranes, and the lungs. They are very small at their origin, and, like the veins, they increase in size, as they diminish in numbers. Like the veins, too, they travel towards the heart, and their



FIG. 36.



FIG. 37.

contents are poured into it. Their walls are composed of two coats; the external is cellular, and distensible; the internal is folded into valves, like that of the veins.

These vessels, on their way to the heart, pass through soft bodies, called *lymphatic glands*, which bear to them the relation that the *mesenteric glands* do to the

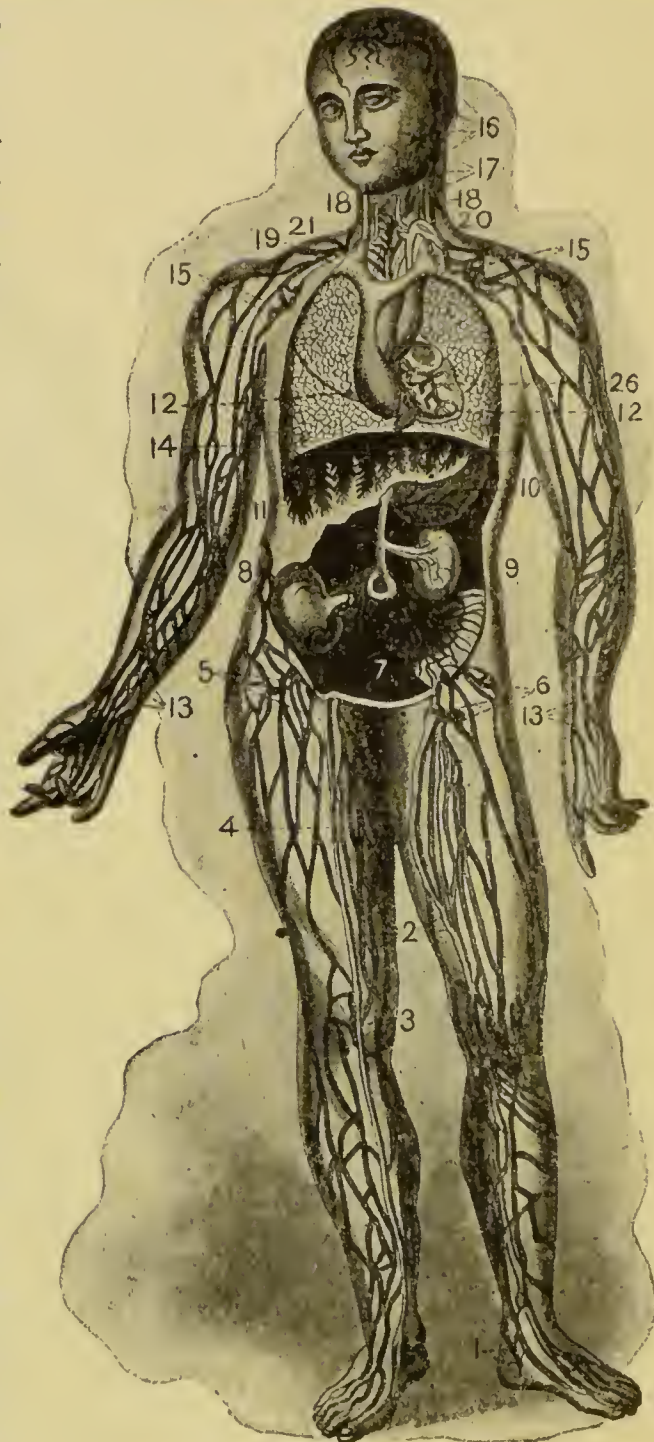


FIG. 38.



lacteals. These glands are a collection of small vessels. The lymphatic glands are most numerous in the neck, chest, abdomen, arm-pits, and groins. They are also found, to some extent, in other parts of the body. Fig. 35 shows a single lymphatic vessel, much magnified; Fig. 36 exhibits the valves along one of the lymphatic trunks; Fig. 37 shows a lymphatic gland with the vessels passing through it.

Fig. 38 represents the lymphatic vessels and glands. 1, 2, 3, 4, 5, 6, show these vessels of the lower limbs; 7, the inguinal glands; 8, the commencement of the thoracic duct, into which the contents of lymphatic are poured; 9, the lymphatics of the kidneys; 10, those of the stomach; 11, those of the liver; 12, 12, those of the lungs; 13, 14, 15, those of the arm; 16, 17, 18, those of the face and neck; 19, 20, the large veins; 21, the thoracic duct; 26, the lymphatics of the heart.

A cold will often cause lymphatic glands to swell. These swellings are called *kernel*s. They often swell, also, without the irritation from cold, and become very much and permanently enlarged, particularly in scrofula. In scrofulous subjects they sometimes suppurate and break, forming bad sores upon the neck.

## The Organs of Secretion.

THE *exhalants*, the *follicles*, and the *glands* are the *organs of secretion*.

**The Exhalants** are the sweat-glands. These have external terminations upon the skin, thus communicating with the air, and internal terminations upon the surfaces of organs not having an outward exposure.

**The Follicles** are small sacs, located in the true skin and mucous membranes. The pores of the skin are the mouths or outlets of these little bags. Veins and organic nerves are sent to these vessels.

**Glands** are soft organs, having a variety of structure, and performing many kinds of secretion. A gland is made up of several lobules, united in one mass, and each of these lobules has a small duct, communicating with a main duct which forms the outlet. Fig. 39 shows a gland; 2, the small ducts spread through its body, and running together; 1, the large duct, through which the secreted substance is carried away.

The mesenteric and lymphatic glands merely modify the fluids which pass through them; others secrete from the blood either fluids to be used in the body, or such as are to be cast away.



FIG. 39.

## The Vocal Organs.

No sounds touch the heart like those of the human voice, for no mechanic, however scientific and skilful, has ever been able to make an instrument which could produce sounds as beautiful, tones as varied, a timbre as melodious, and inflexions as manifold and agreeable. It has been compared to wind, reed and stringed instruments. In touching expression, it is most resembled by the concert-horn, the bassoon, and the hautboy.

Vocal sounds, past all question, are produced in the *larynx*, but these sounds are *grouped*, or formed into articulate speech, by the pharynx, the nasal cavities, the tongue, the teeth, etc.

**The Larynx** is a kind of cavity or tube at the top of the windpipe, formed by the union of five cartilages, namely, the *thyroid*, the *cricoid*, the two *arytenoid*, and the *epiglottis*. Ligaments bind these together, and muscles move them.

**The Thyroid Cartilage** is composed of two parts, and has a connection with the bone of the tongue above, and with the cricoid cartilage below.

**The Cricoid Cartilage** is shaped like a ring, and hence its Greek name. It is narrowest in front, and broadest behind. It connects

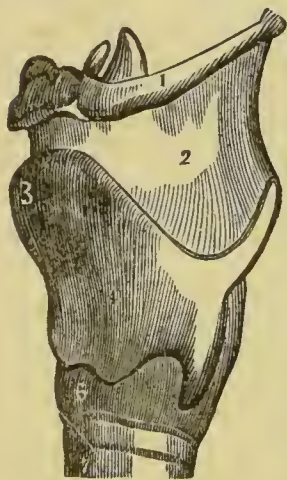


FIG. 40.

with the thyroid cartilage above, and with the first ring of the trachea below. Fig. 40 gives a side view of the cartilages of the larynx: 1, bone at the base of the tongue (os hyoides); 2, the ligament connecting hyoid bone and the thyroid cartilage; 3, the front of the thyroid cartilage; 4, the thyroid cartilage; 6, the cricoid cartilage; 7, the windpipe.

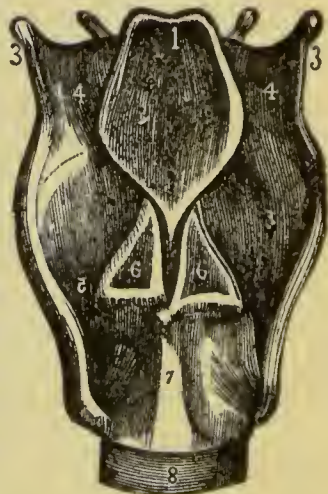


FIG. 41.

Fig. 41 is a back view of the cartilages and ligaments of the larynx: 1, is the back surface of the epiglottis; 3, 3, the os hyoides; 4, 4, the lateral ligaments connecting the os hyoides and the thyroid cartilage; 5, 5, the back face of the thyroid cartilage; 6, 6, the arytenoid cartilages; 7, the cricoid cartilage; 8, the first ring of the windpipe.

**The Arytenoid Cartilages** are upon the back part of the cricoid, and are connected with the thyroid cartilage by the vocal cords.

**The Epiglottis** is a fibro-cartilaginous lid, shaped like a leaf, which covers the upper opening of the larynx. It is connected by a carti-



lage to the bone of the tongue (os hyoides) and to the thyroid cartilage. Breathing opens and shuts it; and in swallowing, it closes down upon the top of the larynx, to prevent food and drink from passing down the windpipe.

**The Vocal Cords** are two ligaments, formed of elastic and parallel fibres, enclosed in a fold of mucous membrane. They are about two lines in width, and inserted behind into the anterior projection of the arytenoid cartilages, and passing forward, are fixed to the anterior angle of the thyroid. There are four ligaments crossing the larynx, two superior and two inferior, — the latter being called vocal cords. The interval between them is the glottis. The ligaments themselves are sometimes called the *lips of the glottis*. The depression between the superior and inferior ligaments is the *ventricle of the larynx*.

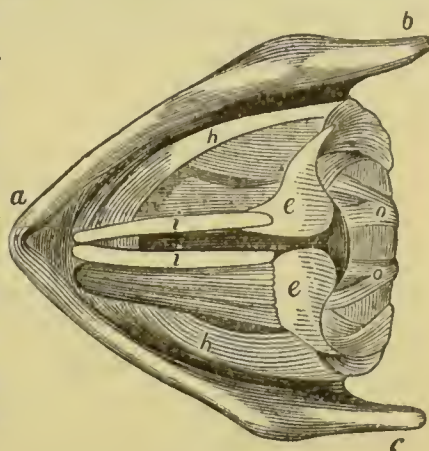


FIG. 42.

Fig. 42 represents a view of the larynx from above: *a, b, c*, the thyroid cartilage, enclosing the ring of the cricoid; *h, h, e, e*, the arytenoid cartilages connected by the transverse arytenoid muscle; *i, i*, the vocal cords; *o, o*, the crico-arytenoid ligaments.

The muscles which are attached to the cartilages have the power of pulling them about so as to change in various ways the shape of the laryngeal cavity; to enlarge or diminish the size of the glottis; and to relax or tighten the vocal cords. By these means, and some others, the sounds of the voice receive their various modifications. Tightening the cords, for example, raises the pitch.

## The Skin.

THE skin is a membrane composed of two layers, covering the entire person. The outer layer is the *scarf-skin* or *cuticle*; the inner is the *true skin* or *cutis* or *corium*. These layers differ in their structure and uses.

**The Scarf-Skin**, called also *cuticle* and *epidermis*, is a thin membrane, partially transparent, like a thin shaving of horn. Having no blood-vessels or nerves, and consequently no feeling, it appears to be a simple covering to protect the true skin from injury by external agents. It is thickest on those parts most exposed to friction.

The scarf-skin is the production of the true skin, — an exudation from it in the shape of a fluid which is spread out as a thin layer, and *dries* up into flattened scales. The cuticle is composed chiefly of these scales, and is constantly being rubbed off as scurf, while new layers are forming underneath.

The lower, softer layer of the scarf-skin, called the *malpighian* layer, or *rete mucosum*, is the seat of *color*. In this part the cells contain a pigment incorporated with the elementary granules, which gives to the various races their several shades of color. The depth of hue is dependent entirely on the amount of this coloring matter.

**The True Skin**, which is called *cutis*, *derma* or *corium*, is a kind of web, woven of small fibres collected into strands. In the upper portion, the web is fine and firm, but grows coarser below. Connected

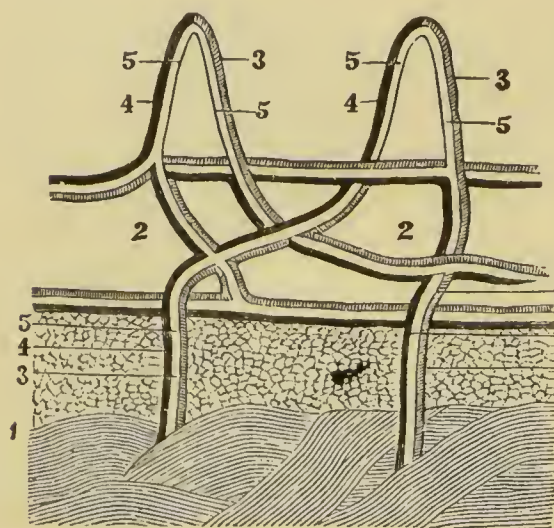


FIG. 43.

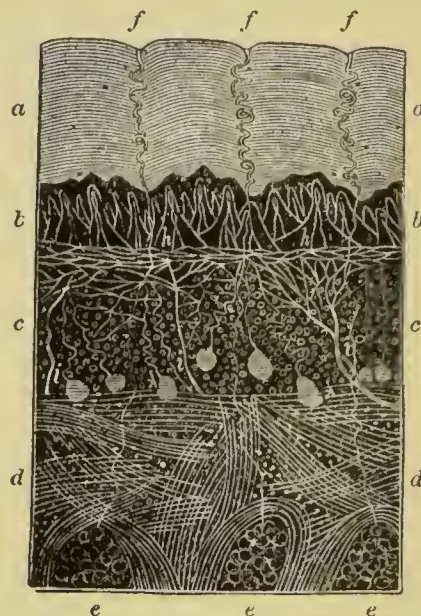


FIG. 44.

with its under surface is a fibrous web in which the fat is deposited. Upon its upper surface is the sensitive or papillary layer, composed of blood-vessels and nerves, doubled into loops, which give little prominences called papillæ. Fig. 43 gives an ideal view of these elevations, composed as they are, of a nerve, an artery, and a vein, lying side by side; 1, 1, represent the true skin; 2, 2, the papillary layer; 3, 3, the arteries; 4, 4, the veins; and 5, 5, the nerves of the papillæ.



FIG. 45.

The arteries, veins, and nerves are spread over the true skin in great numbers,—so profusely, that it is impossible to push the point of the finest needle into it, without piercing a blood-vessel and a nerve.

Fig. 44 gives a view of the skin: *a, a*, the cuticle; *b, b*, the colored layer of the cuticle; *c, c, d, d*, the true skin; *e, e, e*, fat-cells; *f, f, f*, sweat-tubes.

The *lymphatics* are very numerous in the skin, besides which there are *oil-glands* and *tubes*, and *sweat-glands* and *tubes*.

**The Oil-Glands** are imbedded in the skin, and communicate with the surface by small tubes. They are most abundant on the face,



nose and ears. Fig. 45 shows an oil-gland, — *a*, being the gland, *b*, the tube, and *c*, its mouth.

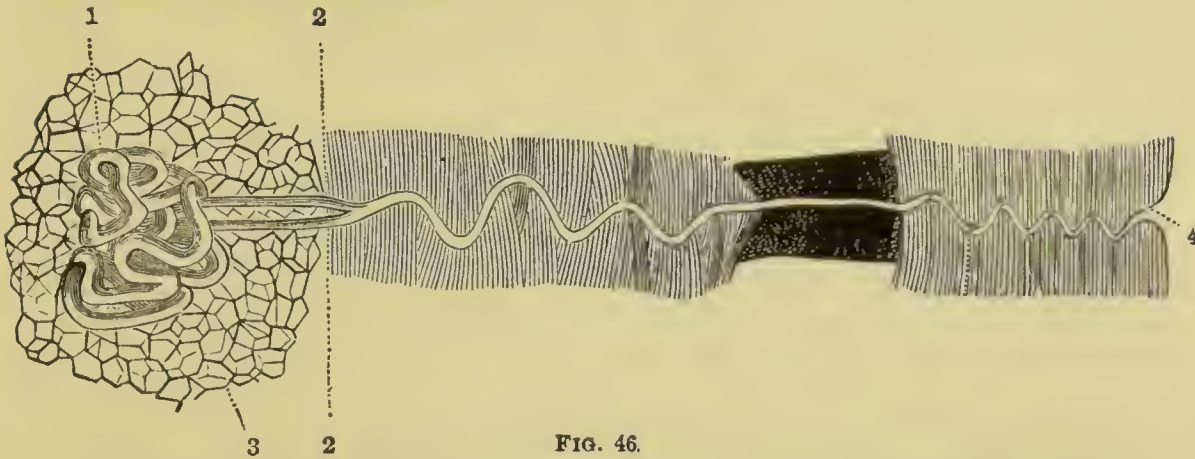


FIG. 46.

**The Sweat-Apparatus** consists of small tubes which pass down through the true skin, and terminate in the meshes at the bottom, where it coils upon itself into a kind of bundle, called the *perspiratory gland*. Fig. 46 gives one of these tubes, with the gland, magnified forty diameters: 1, being the coiled tube or gland; 2, 2, the two excretory ducts from the gland. These uniting form one spiral tube, which opens at 4, which is the surface of the cuticle; 3, are the fat-cells.

The hair and the nails are appendages of the skin.

## The Nervous System.

**The Nervous System** consists of the *brain* and *spinal cord*, connected with each other, and called the *cerebro-spinal axis*; the *cranial nerves*; the *spinal nerves* and the *sympathetic nerve*.

**The Brain** is that mass of nervous matter lodged within the skull-bones. It is made up of three principal parts, — the *cerebrum*, the *cerebellum*, and the *medulla oblongata*. These are nicely covered and protected by three membranes, the *dura mater*, the *arachnoid*, and the *pia mater*.

Fig. 47 shows a considerable portion of the brain, — the skull-bones and membranes being removed. The scalp turned down is represented by A, A; E, E, E, show the cut edge of the bones; C, is the *dura mater*, drawn up with a hook; F, the convolutions of the brain.



FIG. 47.

**The Cerebrum** is the upper and larger portion of the brain, and is

divided into two hemispheres by a fissure. A portion of the *dura mater* dips into this cleft, and from its resemblance to a sickle, is called the *falx cerebri*. The design of this seems to be to support each half of the brain, and to prevent it from pressing upon the other half when the head reclines to one side.

The undulating surface of the cerebrum is produced by what are called *convolutions*. The lower surface of this organ is divided into three lobes, — the anterior, the middle, and the posterior.

The surface of the cerebrum is of a gray color, called *cortical*, or *cineritious*; the central portion is white and fibrous, and is called *medullary*.

**The Cerebellum** is about one-sixth the size of the cerebrum. It lies just under the posterior lobe of the cerebrum, and is separated from it by an extension of the *dura mater*, called the *tentorium*. It is composed of white and gray matter; when the former is cut into, there is presented the appearance of the trunk and branches of a *tree*, called *arbor vitæ*.

**The Medulla Oblongata** is the top of the spinal cord; but being within the enclosure of the skull, it passes for a portion of the brain. It consists of three pairs of bodies, united so as to form a bulb.

**The Dura Mater** is a strong, fibrous membrane which lines the skull and spinal column, and sends processes inward to support the brain, and forward, as sheaths for the nerves which go out from the brain and spinal cord.

**The Arachnoid** is a serous membrane, and like all other serous membranes, is a closed sac. It is reflected upon the inner surface of the *dura mater*.

**The Pia Mater** is a vascular membrane, and lies next to and invests the whole surface of the brain, — dipping into its convolutions. It furnishes nutriment to the brain.

**The Cranial Nerves** which go out from the brain are in twelve pairs. In reading a description of them, let the reader keep his eye on Fig. 48.

**The First Pair**, olfactory (6), passes through several small openings in the ethmoid bone, and is distributed to the mucous membrane which lines the nose. Destroy this, and the sense of smell is gone.

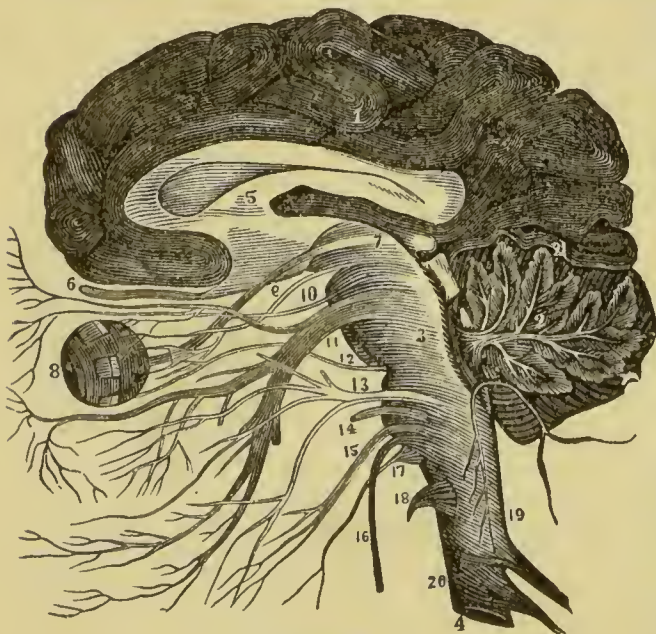


FIG 48.



**The Second Pair**, optic nerve (7), passes through the base of the skull, and enters the cavity of the eye where it is expanded upon the retina. It is a disease of this nerve which occasions a gradual loss of sight, called *amaurosis*.

**The Third Pair**, *motores oculorum* (9), passes through the sphenoid bone to the muscles of the eye.

**The Fourth Pair**, *patheticus* (10), passes to the superior oblique muscle of the eye.

**The Fifth Pair**, trifacial nerve (11), like the spinal nerves, has two roots, and divides into three branches, one going to the eye, forehead, and nose, called the *ophthalmic* branch; another going to the eye, the teeth of the upper jaw, etc., called the *superior maxillary*; and the third going to the ear, the tongue, and the teeth of the lower jaw, and called the *inferior maxillary*. It is a painful condition of the branches of the fifth pair which constitutes the terrible neuralgic affection called *tic-douloureux*.

**The Sixth Pair**, *abducentes* (12), passes the opening by which the carotid artery enters the cavity of the skull, and goes to the external straight muscle of the eye.

**The Seventh Pair**, *portio mollis* (13), is distributed upon the internal ear.

**The Eighth Pair**, facial nerve (14), is distributed over the face. It sends nervous filaments to the muscles.

**The Ninth Pair**, *glosso-pharyngeal* nerve (14), passes through the same opening with the jugular vein, and is distributed upon the mucous membrane of the tongue and throat.

**The Tenth Pair**, *pneumogastric* nerve (15), sends its branches to the pharynx, larynx, gullet, lungs, spleen, pancreas, liver, stomach, and bowels.

**The Eleventh Pair**, spinal accessory nerve (16), connects with the ninth and tenth pairs, and is distributed to the muscles of the neck.

**The Twelfth Pair**, *hypo-glossal* nerve (17), goes to the tongue, and is its motion-producing nerve. It is a nerve of great energy in those who talk much.

**The Spinal Cord** extends from the medulla oblongata, where it is in connection with the brain, down to the second lumbar vertebra. The upper end of the cord presents a bulbous swelling, or enlargement. Another swelling is found where the nerves are given off which go to the upper extremities; and a third near the end of the cord, where the nerves begin which go to the lower extremities.

Fissures dip into the cord before and behind, and divide it into two lateral parts, which are united by a thin layer of white substance.

These lateral columns are divided by furrows into *anterior*, *lateral*,

and *posterior* columns;— the anterior being supposed to be the *motor* column, the posterior that of *sensation*, and the lateral divided in function between motion and sensation.

**The Spinal Nerves**, connecting with the cord, are in pairs, of which there are thirty-one. Each pair has two roots,—a *motor* root,

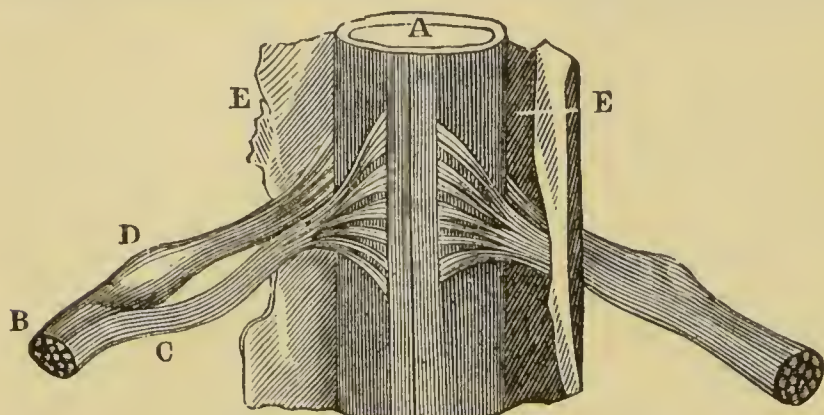


FIG. 49.

C, Fig. 49, arising from the anterior columns of the cord, and a *sensitive* root, D, springing from the posterior columns. A, is a section of the cord, surrounded by its sheath. B, is the spinal nerve, formed by the

union of the motor and sensitive roots. After the union, the nerve, with its motor and its sensitive filaments, divides and subdivides as it passes on, and is distributed to the tissues of the several organs.

The thirty-one pairs of spinal nerves are divided into eight pairs of *cervical*, twelve pairs of *dorsal*, five pairs of *lumbar*, and six pairs of *sacral* nerves.

Fig. 50 gives a view of the brain and spinal cord, with the nerves given off by the latter: 1, 1, being the two hemispheres of the brain; 3, 3, the cerebellum; 4, the olfactory nerve; 5, the optic; 7, the third pair; 8, the pons varolii, so called; 9, the fourth pair; 10, the lower portion of the medulla oblongata; 11, 11, the spinal cord; 12, 12, the spinal nerves; 13, 13, the brachial plexus; 14, 14, the lumbar and sacral plexus.

**The Brachial Plexus** is formed by the interlacing of the four lower cervical and upper dorsal pairs of nerves. It gives off six nerves, which are distributed to the muscles and skin of the upper extremities.

**The Lumbar and Sacral Plexus** is formed by the last dorsal and five lumbar nerves, from which nerves go to the muscles and skin of the lower extremities, and the last lumbar and four sacral, from which nerves are sent to the muscles and skin of the hips and lower extremities.

**The Sympathetic Nerve** consists of a series of *knots* (ganglia), lying along on each side of the spinal column, and forming a knotted chain. There is a knot for each intervertebral space, the neck excepted. These knots are composed of both cineritious and medullary matter.



Each knot is a distinct centre, and gives off branches upward, downward, externally, and internally. All the internal organs are

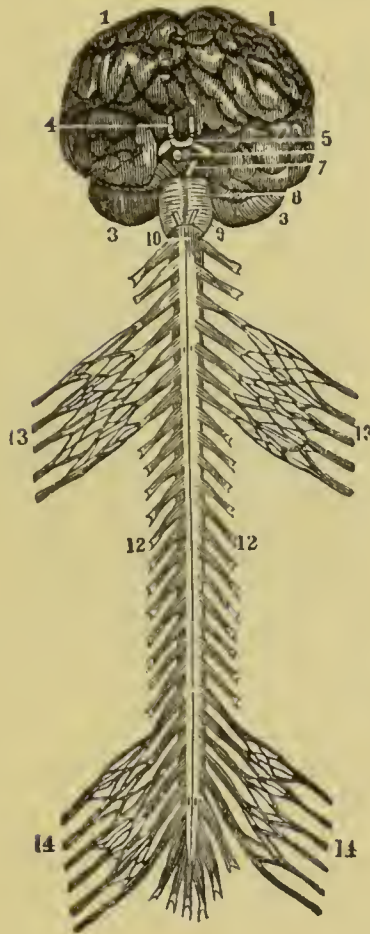


FIG. 50.

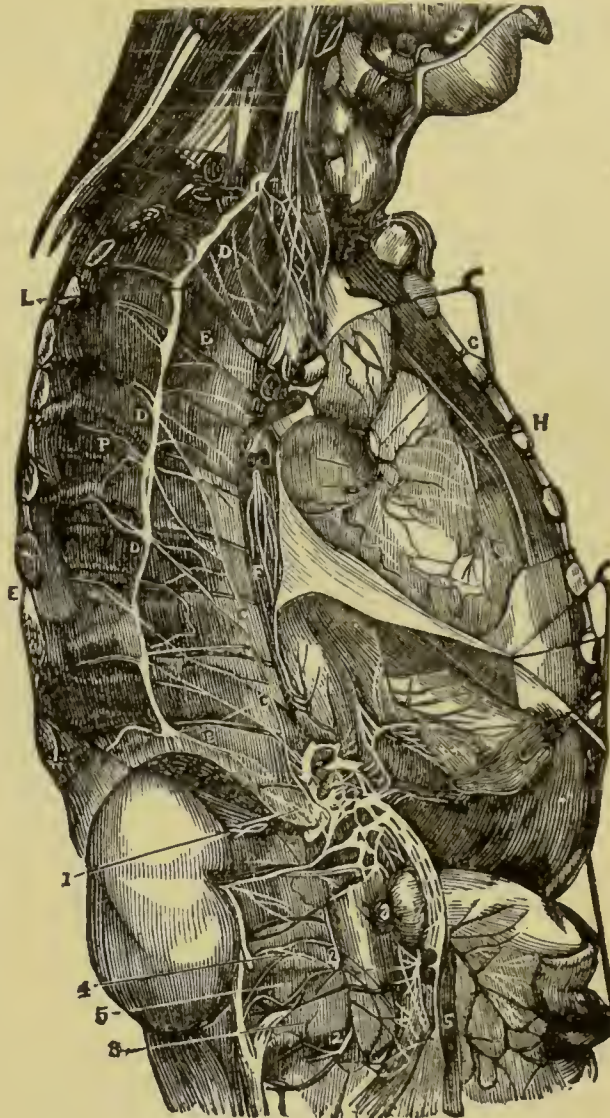


FIG. 51.

supplied with branches from the sympathetic nerve. It is called the nerve of organic life, and is supposed to preside over nutrition, secretion, etc., as the nerves of the brain and cord preside over motion and sensation.

Fig. 51 is a fine representation of the great sympathetic, with its knots, and connections with other nerves. A, A, A, is the semilunar ganglion and solar plexus, lying just under the diaphragm and behind the stomach. Its presence in this region is the reason why a blow upon the pit of the stomach sometimes destroys life. D, D, D, are the thoracic ganglia; E, E, the external and internal branches of the same; G, F, the right and left coronary plexus upon the heart; I, N, Q, the inferior, middle, and superior cervical ganglia; 1, the renal plexus around the



FIG. 52.



kidneys; 2, the lumbar ganglion; 3, the internal branches; 4, the external branches; 5, the aortic plexus.

Fig. 52 represents a plexus, showing how the filaments of one nerve pass to be enclosed in the sheath of another. In this way they change at once the direction of their journey, and their companions upon the way.

## The Organs of Sight.

THE organs of vision are the *optic nerve*, the *globe of the eye*, the *muscles of the eye*, and the *organs of protection*.

**The Optic Nerve** begins by two roots at the base of the brain, the fibres from which meet, as they come forward, and some of them cross each other. The two nerves then separate, and enter the back part of the globe of the eyes, and then spread out into a kind of membrane. In Fig. 53: 1, 1, show the globe of the eye; 2, the crossing of the optic nerve; 8, the origin of two pairs of cranial nerves.

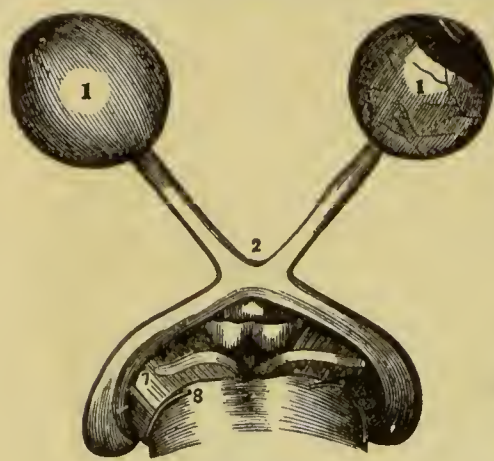


FIG. 53.

**The Globe of the Eye** is a better constructed optical instrument than man ever made. Its interior is filled with what are called refracting *humors* or *mediums*, which are surrounded and

held in their place by membranes, called *coats*.

**The Coats** are the *sclerotic* and *cornea*; the *choroid*, *iris*, and *ciliary processes*; and the *retina*.

**The Sclerotic Coat** is a fibrous membrane, covering the largest portion of the globe. To this the muscles are attached. It is the part which is called the *white of the eye*. It has a beveled edge in front, into which the cornea is fitted.

**The Cornea** is a transparent layer which projects in front, and forms about one-fifth of the globe. It is shaped like a watch-glass. Its blood-vessels are too small to receive the red particles of blood.

**The Choroid Coat** is a vascular membrane. Its color is brown externally, and black within. It is connected with the sclerotic coat externally, and internally with the retina. It is composed of three layers.

**The Iris** is named from its having a variety of colors in different persons. It is the partition between the anterior and posterior chambers of the eye, and has a circular opening in the centre called the *pupil*. Of its two layers, the fibres of the anterior one are radiating, and dilate the pupil, while those of the other are circular, and cause its contraction.



**The Ciliary Processes** are a number of folds formed from the internal layer of the choroid coat.

**The Retina** has three layers. The external is extremely thin; the middle is nervous, being an expansion of the optic nerve; the internal is vascular, and consists of a ramification of minute blood vessels.

The divided edge of their coats may be seen in Fig. 54, namely, the sclerotic, the choroid, and the retina: 2, is the pupil; 3, the iris; 4, the ciliary process; 5, the scolloped border of the retina.



FIG. 54.

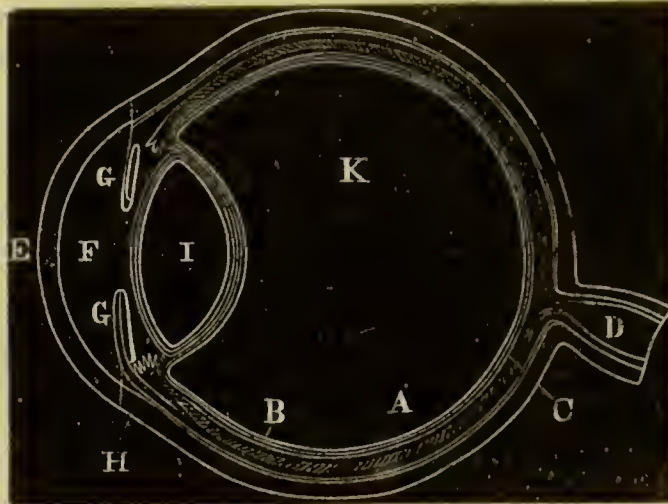


FIG. 55.

**The Humors of the Eye** are the *aqueous*, the *crystalline*, and the *vitreous*.

**The Aqueous** or watery humor is situated in the chambers of the eye. It is an albuminous fluid, with an alkaline reaction, and a specific gravity a little greater than distilled water.

**The Crystalline Humor** is immediately behind the pupil. It is a *lens*, and is convex both on the posterior and the anterior surface.

**The Vitreous Humor** is also an albuminous fluid something like the aqueous humor, but more dense.

In Fig. 55 we have in E a good view of the cornea fitted into the sclerotic coat; A, is the choroid; B, the pigmentum nigrum; C, the retina; K, the vitreous humor; D, the optic nerve; I, the lens; C, the Iris, painted on the back side with pigment; F, the aqueous humor.

The muscles of the eye, six in number, are attached to the bones of the orbit behind, and to the cornea in front, by their tendons. These tendons give the eye its pearly appearance. In Fig. 56, five of the muscles are indicated by *a, b, c, d, e*; *f*, is the optic nerve.

If the internal muscle be too short, the eye is drawn in towards the nose, and the squinting called "cross-eye" is produced.

**The Orbits** are bony sockets which enclose the eye. The optic nerve passes through a large hole at the bottom.

**The Eyebrows** are the projecting arches above, covered with short hair. They prevent the sweat from running down into the eyes, and also shade them from strong light.

**The Eyelids** are the curtains which rise and fall in front. The smooth membrane which lines them is called the *conjunctiva*. It secretes a fluid which makes the eyelids open and shut easily.

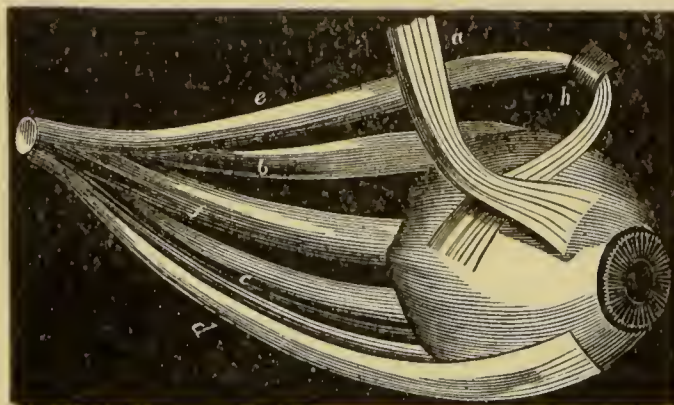


FIG. 56.



FIG. 57.

**The Lachrymal Gland** is at the upper and outer angle of the orbit. Several small ducts open from it upon the upper eyelid, through which the tears run down upon the conjunctiva.

**The Lachrymal Canals** begin near the internal angle of the eye, by two small-tear points, which communicate with the sac at the upper part of the nasal duct.

**The Nasal Duct** is a canal about three-quarters of an inch long, which runs down to the inferior channel of the nose.

Fig. 57 shows these organs: 1, being the lachrymal gland; 2, the ducts leading to the upper eyelid; 3, 3, the tear-points (*puncta lachrymalis*); 4, the nasal sac; 5, the termination of the nasal duct.

## The Organs of Hearing.

**The External Ear** is composed of the pavilion of the ear (the pinna), and the auditory canal (the *meatus auditorius externus*).

**The Pinna** surrounds the entrance to the auditory canal. It stands out from the head, and is in common language called the ear.

**The Meatus Auditorius** is a canal about an inch long, partly bony and partly cartilaginous, which goes from the pavilion of the ear to the *drum of the ear*.

**The Drum of the Ear** (*membrana tympani*) is an oval-shaped thin membrane, inserted into a groove around the auditory canal.



**The Tympanum** is a cavity within the temporal bone.

**The Eustachian Tube** is a channel of communication between the tympanum and the upper part of the pharynx. The object of this is to convey air to the drum of the ear, as without air no sound can be produced.

**The Labyrinth** is a series of chambers through the petrous bone — embracing the *vestibule*, a three-cornered cavity within the tympanum; the *semi-circular canals*, communicating with the vestibule, and the *cochlea*,

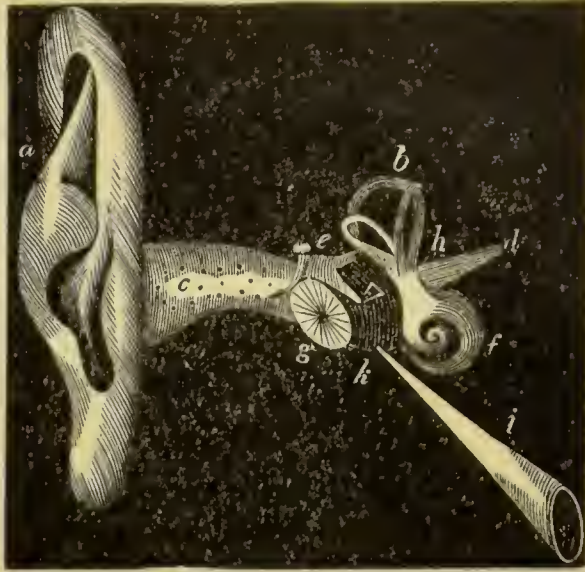


FIG. 58.

which makes two and a half turns around an axis, called the *modiolus*.

In Fig. 58, *a*, is the pavilion of the ear; *c*, the auditory canal; *g*, the membrana tympani; *k*, the tympanum; *e*, the bones of the ear; *b*, the semicircular canals; *f*, the cochlea; *h*, the vestibule; *i*, the eustachian tube; *d*, the auditory nerve.

In Fig. 59, we have a view of the labyrinth laid open, and highly magnified: 1, 1, being the cochlea; 2, 3, the channels that wind around the central point (5); 7, 7, the vestibule; 8, the foramen rotundum; 9,

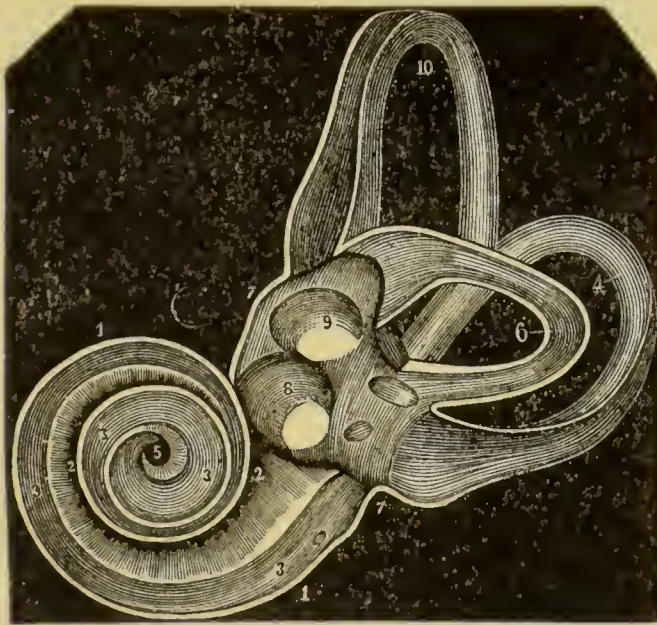


FIG. 59.

the fenestra ovalis; 4, 6, 10, the semicircular canals.

# HYGIENE

## Physiological Laws of Life and Health

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It is absolutely necessary that every person should be conversant  
with Hygiene, to understand the laws of health.



# PHYSIOLOGICAL LAWS OF LIFE AND HEALTH.—HYGIENE.

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## Life, the Infancy of Being.

It may be stated as a general truth that man has but just learned to live when he is ready to die. We expend a large portion of our lives in searching out our mistakes, and in striving to undo the mischiefs they have occasioned. This is true in reference both to our moral and our physical life; and I draw from it the conclusion that the present must be only the infancy of our being, and that our blunders and consequent sufferings here will cause us, in the great hereafter, to place a higher value upon knowledge, and to struggle with new fortitude to rid ourselves of every bondage.

A life which has just begun to take shape and symmetry, cannot be permitted, I think, under the rule of a benevolent Creator, to become extinct. We shall certainly be permitted to take up the broken thread of life, and, in the clearer light of the future, with the warning experience of the past, and surrounded by better guards, to try again. In the meantime, while here, the sooner we become acquainted with the laws of life, and the better we obey them, the more we shall enjoy.

## The Nervous System.

MAN is brought into connection with the outward world through the senses of feeling, seeing, hearing, etc. These communicate with the brain and mind through the nerves of sensation.

The nervous system is divided into two great central portions, the brain and the spinal cord; and these together are called, by the learned, the *cerebro-spinal centre*. There are numerous pulpy white cords, called nerves, which at one end are connected with this great axis or centre, and from thence run to all parts of the system. A portion of these nerves start from the base of the brain and run to the eye, the ear, the tongue, etc. (Fig. 48); while another, and a larger part spring from the cord which runs through the backbone, and are distributed over the body and the lower extremities (Figs. 50 and 60). One portion of these cords produce feeling; another part, motion. The former we call sensitive; the latter, motor. Both kinds are widely distributed over the body. Those which spring from the spinal cord have two roots, one uniting with the *back*, the

other with the *front* part of the cord. Cut off the back root, and the part to which it is distributed loses its feeling. As we say in common language, it becomes *numb*, though it may *move* as well as before. Cut the front root, which is motion-producing, and the part to which it goes cannot move. It is *palsied*, though it may still feel acutely. The numerous nerves that spring from the spinal column are pretty well represented in Fig. 60.

If the cranial nerves of motion which go to the face be cut, no emotion or passion can be expressed. The features will all be immovable, like statuary. To smile, to laugh, to frown, to give expression to the feeling of pity, or anguish, or love, is alike impossible. And yet a breath of air upon the face will be *felt* as readily as before. Paralysis, or palsy, as it is called, partial or general, is the result of injury upon few or many of these motion-producing nerves. Neuralgia, tic douloureux, etc., arise from some disease, perhaps inflammation, of the nerves of sensation.

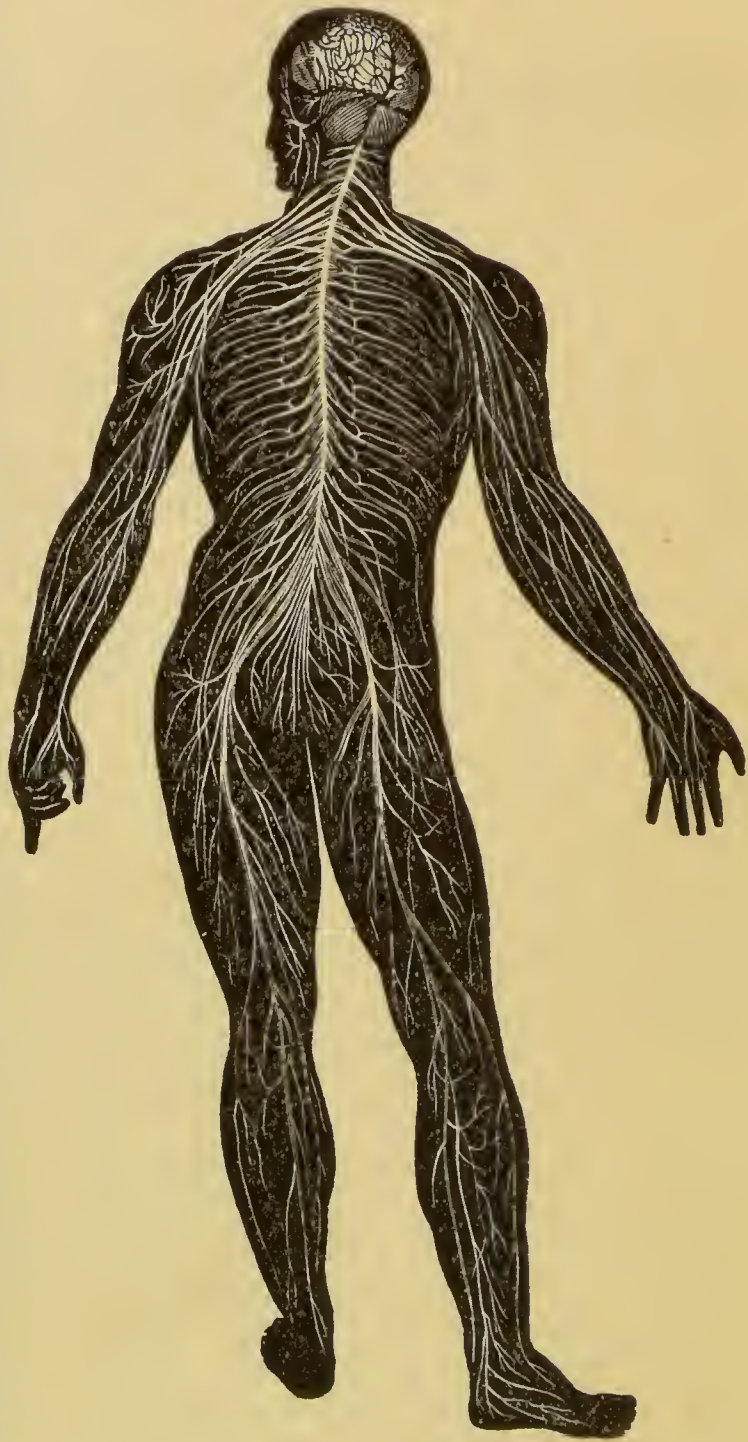
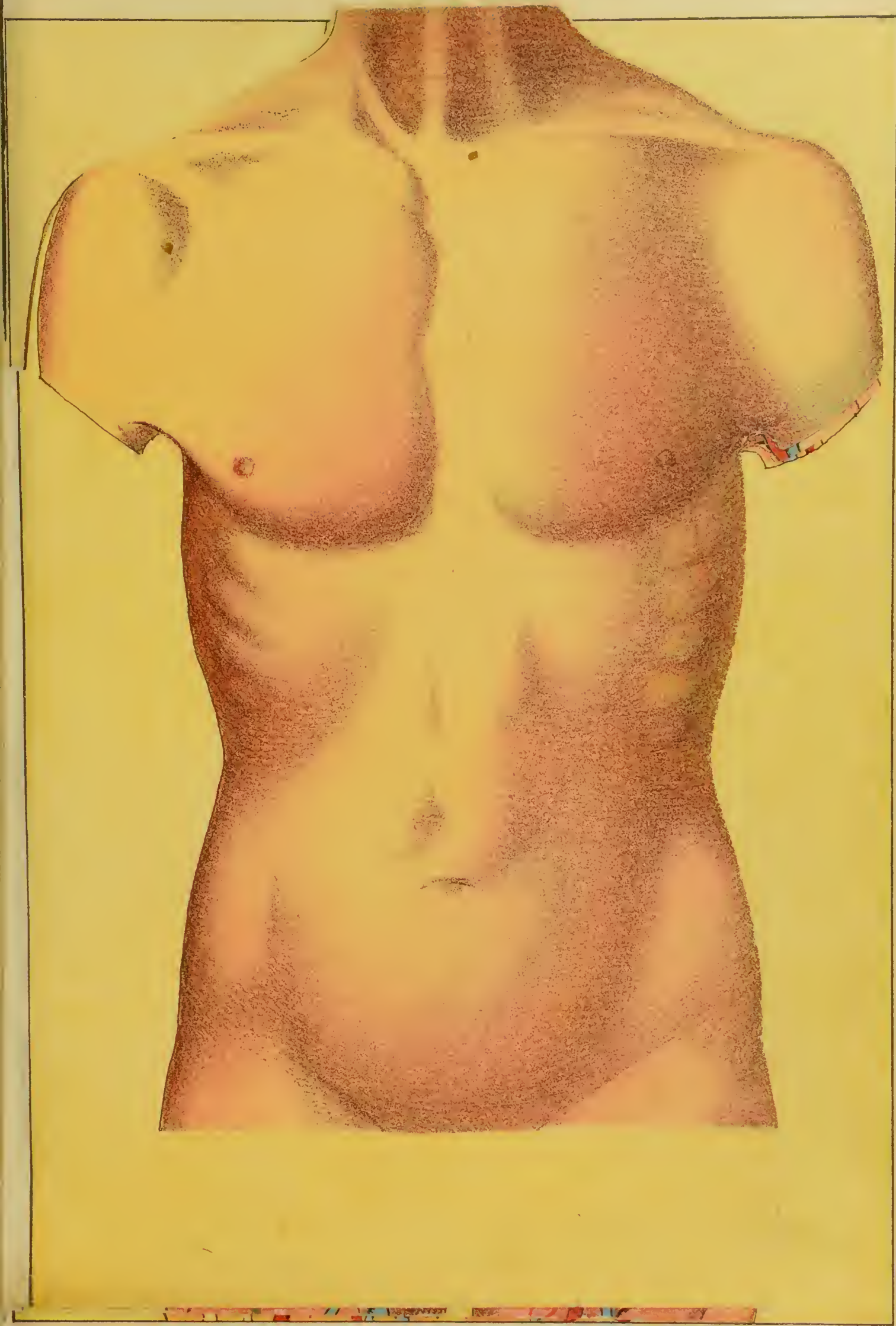


FIG. 60.

**How the Mind gets Knowledge.** Everything the mind knows of the external world, it learns through the the organs of sense, which communicate with it through these nerves. Thus, the nerves are acted on by external agents, and then they act on the brain and cause sensations. When the hand is burned the nerves of sensation run with the intelligence to the brain, which, quick as thought, through





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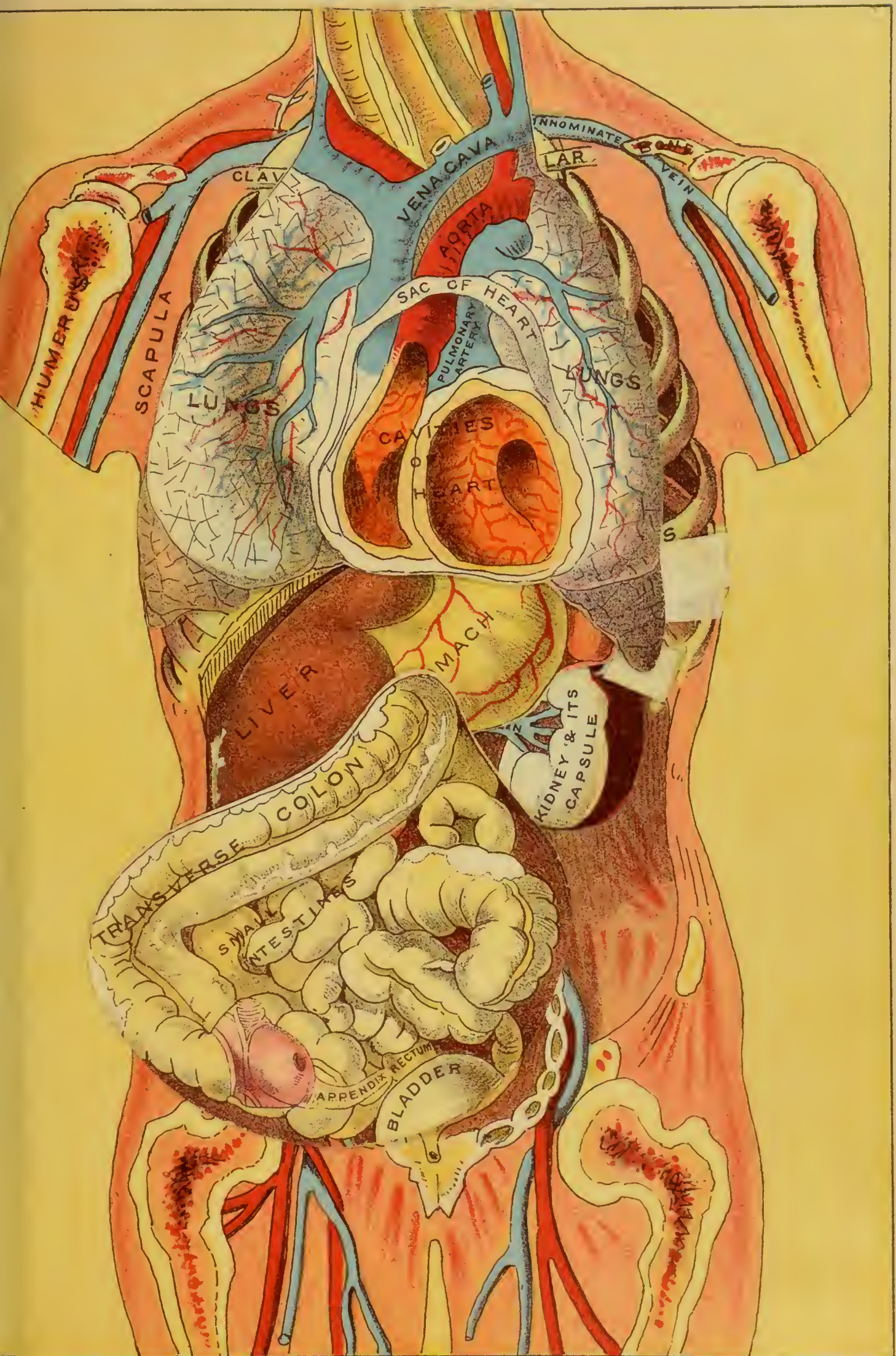
















the nerves of motion, despatches orders to the muscles to repel the injury.

**Comparison.** — The arrangement and operation of the nervous system are like those of the electric fire-alarm system of a city. The brain is the intelligent centre, like the central office. The nerves of sensation which carry to the brain, with electric speed, intelligence of what is going on outside, are like the wires which run to the central station from the several boxes. The quick carrying to the brain of any information of injury done to some part of the body, is like sending to the central station from an alarm-box the intelligence of fire in one of the districts. The rapid transmission of orders from the mind to the muscles is like flashing the alarm over the wires to every part of the city. And, finally, the powerful action of the muscles in warding off danger is like the dashing of firemen over the pavements and the energetic playing of the engines.

### Sensations.

AN effect produced on the mind through a nerve is called a *sensation*. Hunger is a sensation. It is an effect produced upon the mind through a certain nerve by the condition of the stomach. Thirst, pain, heat, cold, are sensations in a similar sense. Nausea is a sensation produced by some injurious substance acting upon the coats of the stomach.

**Strength of Sensation.** — Some sensations are much stronger than others; some are very intense. A very strong sensation is called a feeling. It is common to say, "I feel cold," or, "I feel hot." We simply mean by this, that the temperature of the weather makes a very powerful impression upon us.

**Kinds of Sensation.** — Sensations are either pleasurable or painful. Pleasurable sensations arise from the proper exercise of some healthy part of the body; and they are a suitable reward for any care the mind may take of the corporeal organs.

The sensations arising from a proper amount of exercise are pleasurable. The muscles find a sort of enjoyment in action. He who leads a sedentary life, either from choice or necessity, loses much enjoyment. Hence, there is pleasure in labor; and the working-man, though often pitied by the wealthy, is generally the happiest of men. The eye and the ear, when directed to agreeable sights and sounds, derive the most agreeable sensations from exercise. The air of a beautiful spring-morning gives impressions which none can describe, but which all know to be delightful. These impressions are well fitted to reward us for taking at that season, in the open air, the exercise we so much need.

**Moral Uses of Sensations.** — How little we reflect upon the amount of happiness it is in our power to create by making agreeable

impressions upon others. A civil and polite address makes a pleasant impression. A kind word, fitly spoken, makes the heart glad. Heads of families might do much to increase the happiness of their domestics in the kitchen by meeting them with a pleasant countenance, and dropping in their ear, now and then, a word of approval. Such little acts of benevolence are easily performed, and they make the most agreeable and lasting impressions upon persons in the lower stations of life, — creating attachments, in fact, which end only with death, and which in hours of future sorrow, which come to all, may refresh us like springs of water in the desert.

“Full many a shaft at random sent,  
Finds marks the archer little meant;  
Full many a word at random spoken,  
May heal a wounded heart that's broken.”

SIR WALTER SCOTT.

In aiming to make agreeable impressions upon domestics, we should be governed by the simple desire to create happiness. Their sources of happiness are comparatively few. They spend their days below stairs, — shut out from a portion of the light of day, and from the refining influences of the drawing-room, — having little time for rest or for recreation. How unfeeling to treat such persons with harshness, to wear a frowning face in their presence, and thus wither the few flowers of happiness which bloom around them!

Every human being is endowed with the beautiful nervous organism of which I have spoken, and is daily receiving impressions, pleasurable or painful, from thousands of sources. In all the relations of life, it should be our aim to touch delicately this sensitive structure. Wives may add much to the happiness, and I may say, to the affection of their husbands, by always wearing a pleasant face; and the heart of the wife may be made light and glad by gentle words from the husband. We cannot but love those who make pleasurable impressions upon us, and we necessarily dislike such as impress us painfully. Most of the coldness and alienations which grow up between the heads of families, spring from the habit of one of the parties, of saying, or doing, or looking something which painfully impresses the other. A woman who habitually wears a “sour” face cannot be loved either by her husband or her children. The man or the woman who desires to be loved, must cultivate a manner, a look, a speech, a life, the whole scope of which is fitted to make pleasurable impressions upon others. It is against nature to love what gives us pain.

**Agreeable Sensations a Source of Health.** — Pleasurable sensations not only beget love, and increase happiness, but they add much to health. They exhilarate the spirits and drive away melancholy. Travelling promotes health and prolongs life, by the number and variety of the pleasing impressions it makes upon the mind.

**Care of the Sick.** — If the above statements be correct, how important that the sick should be so dealt with as to have none but



**Ventilation.** — This shows the great necessity of having dwellings, churches, and school-houses well ventilated.

Were a good system of ventilation adopted in all our churches, ministers would seldom preach to sleeping audiences. A congregation sitting in one of our places of public worship, where the air in a single afternoon is as many times used over as the minister's sermons are in a lifetime, can neither hear with attention, nor comprehend with clearness.

In many of our school-houses, the ventilation is quite as bad, and the consequences worse, because they are occupied six hours of the day instead of three, and five days of the week in place of one. In the small school-houses which our children filled to overflowing in former years, in which there was *no* ventilation, unless they happened to be blessed with an old-fashioned chimney and fire-place, the effects upon the nervous system of the children was deplorable. Many of the diseases which afflict the present generation of men and women had their origin in the bad air of those crowded nurseries of education.

Our dwellings were partly ventilated in olden time, when the open fire-place received the "back-log," the "top-stick," the "fore-stick," and other sticks to match; but since we have been warmed by the stove and the furnace we have known little of the luxury of pure air at the domestic hearth.

**Need of Exercise for the Brain.** — Health requires that the brain should be properly occupied with vigorous thought. The same reasons may be given for this as for the exercise of the muscles. It is governed by the same laws which apply to other parts of the system. Use improves its strength and vigor; idleness causes it to grow feeble. Of course the labor it is put to should be only reasonable in amount, and should not be too long continued at any one time. With the weakening of the brain, the whole bodily forces, and indeed the whole mental and moral character, fall into feebleness and decay. It is a great mistake to suppose that the cultivation and even vigorous use of the mind impairs health and shortens life. Just the opposite is true. Many of the most eminently intellectual men, who have worked their brains hard all their lives, have been distinguished for long life.

**Bad Effect of Change in Circumstances.** — No class of persons suffer more from nervous diseases and general ill-health than those who, having worked hard in early life, with little or no cultivation of the mind, are suddenly raised to wealth, and immediately drop all exercise, and fall into habits of indolence and luxury. The condition of such persons would be much less pitiable, did they take up books when they lay by the hoe or the broom. But they seldom do this. Many a woman, in early life, has felt the glow of health in every limb, and a thrill of pleasure, too, while scrubbing the floor on her hands

and knees, who has, in subsequent years, reclined in misery upon her damask-covered lounge, and wondered that she could not have the health of other days. Let her cultivate her brain, live temperately, and exercise in the open air, and life may again have real pleasures for her.

**Discretion in Exercising the Brain.** — In exercising the brain we must use discretion. We must not sit down in the morning, and ply it with work during the whole day, without rest. This would soon bring upon it disease, or premature decay. It should be worked only until it begins to show symptoms of fatigue. Then it should be permitted to rest; or, what is better, be turned to some new subject, of a lighter, or a different character. This often rests the brain better than to entirely suspend its action.

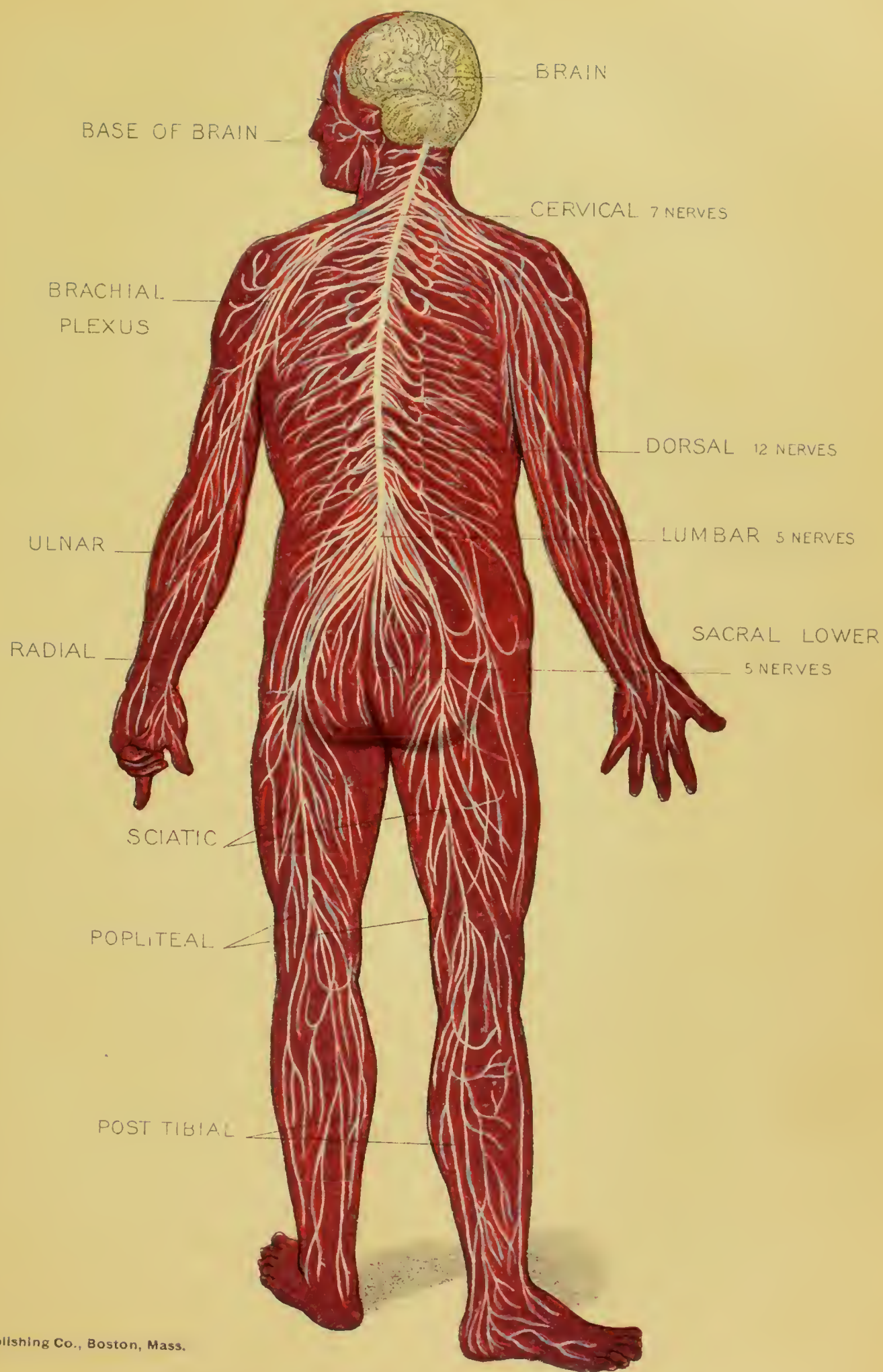
**Overworking the Brain in Childhood.** — Great care should be used not to exercise the brain too much in early life. Like other parts of the system, it is tender in childhood, and will not bear prolonged exertion. As a general thing, children are put to school too early, and made to work their brains too hard. Great mischief arises from this source. Children are born with larger brains now than formerly; and it is no uncommon thing to see upon a child of ten years, a head equal in size to that of an adult. Children run to brain. Precocity in development of brain and mind is common. The results of stimulating and hastening the unfolding of such minds are deplorable. In such children, the brain should be the last thing to be cultivated. We do not need to urge its growth. It will come forward fast enough in spite of us. Our chief aim should be to harden and fortify the general constitution, so that the brain which it is required to bear up and sustain may long be its crown and glory.

Yet parents are proud of their precocious children, and often reverse this rule. They do it thoughtlessly, and would be terribly startled could they suddenly look into the future and see the results of their folly. Could they do so, they would see inflammation and softening of the brain, epilepsy, insanity, paralysis, apoplexy, with all the horrors of undescribed and indescribable nervous affections, which, though without a name, have a terrible reality.

**Old People's Brains.** — Persons in advanced life should be particularly careful not to overwork the brain. In middle life it recovers easily from great fatigue. In the decline of life, its powers of recovery are feeble. A single exhaustion may cause its fatal collapse. Old age should be distinguished for gentleness and moderation. The journey of the down-hill of life should be made by short and easy stages, through regions of diversified beauty.

**A Supply of Blood.** — Every part of the system, when hard at work, needs and must have a very large supply of pure blood. Without this, it is torpid and inactive. To cause the blood to flow to any particular part, it must be exercised. The lumberman, when





NERVES OF THE HUMAN BODY





in the forest in extreme cold weather, stamps his feet violently upon the ground, or beats them against a log, and whips his hands around his body, and in this way makes them red and warm with a new supply of blood. The stomach, when it has received a supply of food, begins earnestly to turn it over; and by this exercise, and the stimulus which the food supplies, it invites large quantities of blood to its vessels, and thus increases its power to work. But just in proportion that it draws the vital current to *itself*, and augments its *own* vital force, it diminishes the blood in *other organs*, and for the time being, unfits them for work. The same may be said of the brain and all other working organs.

From this it follows that only one organ, or set of organs, can work effectively at the same time, and that it is improper to put the brain to hard work immediately after a full meal, because the stomach then wants the blood to enable it to digest the food; and if the blood be called off to the brain, digestion will stop. Nor should the stomach be loaded with food directly after long and hard thinking; for the brain will yield up the blood to it only after its own excitement has had time to subside.

### Sympathetic Nervous System.

THE object of this system seems to be to bind all parts of the body together, and to combine and harmonize their actions. It takes care that no part of the system acts in such a way as to injure any other part. It exerts a controlling influence over digestion, nutrition, absorption, the circulation, etc. These are natural processes which need to go on while the brain is asleep and cannot attend to them. The nervous system, of which I speak, presides over all those functions which are called involuntary, — so called because no act of the will is needed for their performance. Secretion, absorption, digestion, and the circulation of the blood, all have to go on while we sleep, as well as while we wake. Were an act of the will necessary to their performance, as in walking, eating, conversing, etc., then they would have to cease the moment the brain fell asleep, and death would be the result.

The sympathetic nerves apprise each part of the system of the condition and wants of every other part. When the lungs are inflamed, the stomach seems to be aware of it, and will receive no food, because this would aggravate the disease of the neighboring organs. Well would it be if human beings would exercise a like forbearance, and abstain from those acts of self-gratification which they know will injure their neighbors.

**Effects of Nervous Diseases.** — Before closing these observations, I wish to add a few words respecting the terrible effects of nervous diseases which characterize the present time.

That they are far more numerous and afflictive than in former

years, must be apparent to the most careless observer. They are nothing more nor less than the price we pay for a high civilization, and especially for our democracy. Among us, every man feels his individuality, and has a motive for thinking and doing his best. Thought and action are here unfettered; and if the race is not to the swift, nor the battle to the strong, every man acts as though he thought it was. The great excitement which the struggle for wealth kindles and inflames, deranges and shatters the nervous system to a shocking degree.

And wealth, when obtained, does its full share to weaken the nerves. It brings with it high living, indolence, loss of energy, dissipation, and a weakening of the whole moral and physical powers. It *need* not do this; but, in most cases, it does.

The result is, that, at least, every other person has some nervous disease, which makes life a misery rather than a blessing. The brain and nerves are too much developed in comparison with the development of the muscles. Half our boys and girls have heads as large as men and women. It is common to see a boy or a girl at ten talking and acting like a man or woman. I do not mean by this, that they imperfectly imitate the actions of older persons. It seems to be natural to them. Their brains are prematurely developed, and their acts and thoughts have the maturity of adult life.

**What is Coming?** — What will be the result of this state of things, no man can predict. I sometimes think the race will break down; that that which was intended to be its ornament and strength will be its destruction. I hope not. Yet there is danger of it. Nothing can save us but the wisdom to adopt such means as will develop all parts of the system alike. No race of men can stand for many generations such a strain upon the nervous system, unless better means are adopted to counterbalance its evil effects than are now used in the United States. We have got to pause in our swift career, and look after our health, or we shall become a nation of maniacs. No proof is needed of what is here said.

**Hopeful Considerations.** — It is proper to say, the considerations here presented, terrible as they are, are mitigated in some measure by others of a more hopeful character.

Physiology and the laws of life are now better understood than at any former period. These subjects are getting into our common schools, and are engaging the attention of our youth. Declining health has already made us think more of the means of preserving it, — such as diet, exercise, bathing, travelling, and amusement. To encourage and intensify this hopeful direction of the public mind, I propose to devote a few pages to these subjects.



## Food and Digestion.

FROM the earliest dawn of existence to the last moment of life, our bodies are constantly changing. Old particles of matter, when they are worn out, leave their places and are thrown out of the system. Were this the whole of the matter, our bodies would soon waste away, and that would be the end of us. But as fast as the old materials are thrown away, new ones take their places; and it is solely out of our food that these new materials are formed.

In order that the food may be well digested, it must first be broken into small particles in the mouth. The act of chewing it is called mastication. During this act, if it be well performed, a large quantity of spittle, called saliva, flows out of a number of glands, called salivary glands, and mixes with the food, forming with it a soft mass. In this condition, it is thrown backward into the top of the throat, called the pharynx. Here, a little cartilage, called the epiglottis, drops down upon the opening into the top of the windpipe, and prevents its entrance into the breath-passage; and it is pushed along into the gullet, a tube which runs down behind the windpipe and lungs, and which physicians call the œsophagus. Here a succession of muscular bands, circular in shape, contract upon it, one after another, and force it down into the stomach.

It is important that two things should be secured while the food is in the mouth, namely, that it should be reduced to a good degree of fineness by chewing, and that a proper amount of saliva should be mixed with it. If the chewing were not necessary, teeth would not have been given us; and the salivary glands would certainly not have been put in the mouth, if the mixing of water with our food would serve the purposes of digestion as well.

**Eating too Rapidly.** — Americans have fallen into a pernicious error in eating their food too rapidly. Time is not given to chew it sufficiently to excite a full flow of saliva; and as it cannot be swallowed in a dry state, it is not uncommon to see persons taking a sip of water after every second mouthful, to enable them to force it into the stomach. It is a habit we Americans have of cheating ourselves both of the pleasures and the benefits of eating; for the only real pleasure of eating arises from the flavor of food while retained in the mouth, and the only benefit we can derive comes in consequence of its proper digestion.

The food when received into the stomach is in the same condition as when taken into the mouth, except that it is, or should be, ground fine by the teeth, and well mixed with saliva.

**The Gastric Juice.** — The stomach, like the mouth, the windpipe, and the gullet, is lined by a mucous membrane. The chief office of this membrane is to secrete, or take out of the blood, a fluid which we call gastric juice, which means stomach juice, from the Greek

name of stomach, γαστήρ (gaster). This fluid has not much smell or taste, and looks like spring water. It has a powerful effect upon food, which, when mixed with it, soon undergoes an important change, which is apparent to the taste, the smell, and the sight. The nature of the gastric juice and how it produces its effect upon food are not certainly known; but it contains two active elements, — a free acid and pepsin, whose function is to dissolve the nitrogenous parts of the food and convert them into albuminose or peptone. The albuminose is absorbed by the coats of the stomach and enters directly into the circulation; while the sugar and fat pass on to the duodenum to be acted upon by the bile, the pancreatic juice, and other secretions of the bowels.

**Too Much Cold Water at Meals.** — There are some interesting facts connected with the formation of this fluid, of which it is important that every person should be apprised.

Its quantity and quality depend on the amount and healthfulness of the blood which flows to the stomach during the first stage of digestion. It is, therefore, injurious to drink large quantities of very cold water with, or immediately after, our meals; as this will chill the stomach, and repel the blood from its vessels, so that but little of the juice can be formed. Digestion, in such case, must be imperfect.

**This Fluid not Secreted Without Limit.** — This fluid does not flow into the stomach continuously, but only when we swallow food, and then not as long as we please to eat, but merely till we have taken what the system requires. If, in the amount we take, we go beyond the wants of nature, there will not be fluid enough formed to dissolve it, and the whole will be imperfectly digested, and be a source of injury rather than benefit. This should teach us to be careful that our food be only reasonable in amount.

**Not Secreted in Sickness.** — When we are sick, the gastric juice is either not formed at all, or only in small quantities. Whatever may be our feelings of lassitude, and however much we may appear to need food, at such times, it is useless to take it, for it cannot be digested, and will only aggravate our disease. If the illness be only slight, the fluid will be formed to some extent, and food may be taken in proportion.

**Its Secretion Favored by Cheerfulness.** — A cheerful disposition, and a happy, lively frame of mind, are highly favorable to the production of the gastric juice; while melancholy and anger and grief and intense thought of business, at the hour of meals, greatly hinder its natural flow.

This should teach us to go to our meals with light hearts, and to make the family board a place of cheerful conversation, and of a light and joyous play upon the mirthful feelings of all present. Should any of the family circle be in the habit of using vinegar as a condi-



ment, we should never be guilty of compelling them to extract it from our faces. A vinegar face is not easily excused anywhere; at the table it is unpardonable. A single countenance of this description will throw a gloom over a tableful of naturally cheerful persons; and if habitually present at the board, may finally spoil the digestion of half a dozen, and entail dyspepsia upon them for life.

The stomachs of the sick pour out but very little of this fluid, and they can take but a small amount of food. It is cruel to deprive them of the power of digesting that little by treating them harshly, and filling them with gloomy and desponding feelings. I therefore repeat the substance of the advice given on a previous page: Deal gently with the sick.

**How all this is Known.** — As the stomach is wholly concealed from view, the reader will very naturally ask how it is known that the gastric juice is poured into it in certain states of the mind, etc., and withheld in others. It certainly could not have been so accurately known, had it not been for an accident which opened the living and working stomach to the inspection of Dr. Beaumont, a United States Surgeon. A young man by the name of Alexis St. Martin, a Canadian by birth, but then in the State of Michigan, had a large part of his side torn away, and a hole of considerable size made into his stomach, by the accidental discharge of a gun. To the surprise of his surgeon, St. Martin recovered; and the edges of the wound in the stomach refused to grow together, preferring rather to fasten themselves to the borders of the breach in the side, thus leaving the passage open. A kind of curtain grew down over this, which prevented the food from falling out. Dr. Beaumont, taking advantage of this state of things, instituted a series of valuable experiments, by lifting the curtain, and inserting various articles of food, and witnessing the process of digestion.

**Movement of the Stomach.** — The presence of food in the stomach causes its muscular coat to contract and throw it about from side to side, mixing it thoroughly with the gastric juice, and reducing it to a pulpy mass, called *chyme*. This, as fast as it is properly prepared, passes through the pylorus into the upper bowel, or *duodenum*, called also the *second stomach*.

**Chyme.** — A certain witty professor of anatomy and physiology was in the habit of asking his class if they ever saw any chyme; and when they answered, no, as they often did, he called their attention to what is occasionally to be seen in the morning, upon the sidewalks, where drunken men have held themselves up by lamp-posts, and left the contents of their stomachs.

The pylorus, or opening into the bowel, has a very singular and wise instinct, which is worthy of remark. When a piece of food, which has not been digested, attempts to pass into the bowel, the moment it touches the inner surface of this orifice, it is instantly



thrown back by an energetic contraction; though a portion of well-prepared chyme, touching the same opening immediately after, is allowed to pass unchallenged.

**Chyle.** — The chyme, when it reaches the duodenum, seems to cause the liver to secrete bile, and the pancreas to produce pancreatic juice. These two fluids are conveyed into the upper portion of the second stomach, and there are mixed with the chyme, and cause it to separate into a delicate, white fluid, called *chyle*, and a residuum, which, being worthless, is pushed onward, and thrown out of the body.

**Bile in the Stomach.** — Most persons suppose that the bile is generally found in the stomach; but this is a mistake. It is thrown up by vomiting, because in that act, the action both of the first and the second stomach is *reversed*, and the bile is forced up from the duodenum — taking a direction the opposite of its usual course.

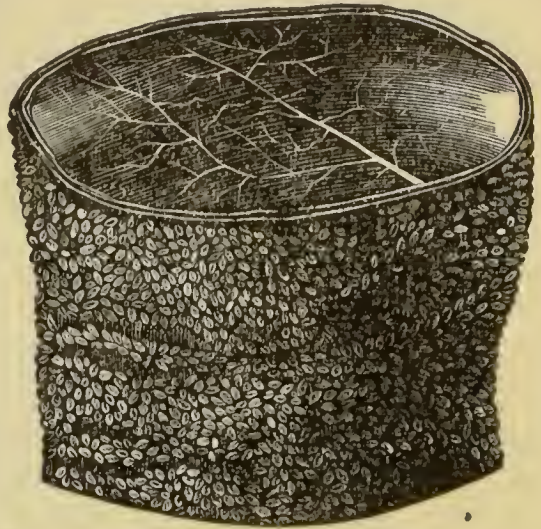


FIG. 61.

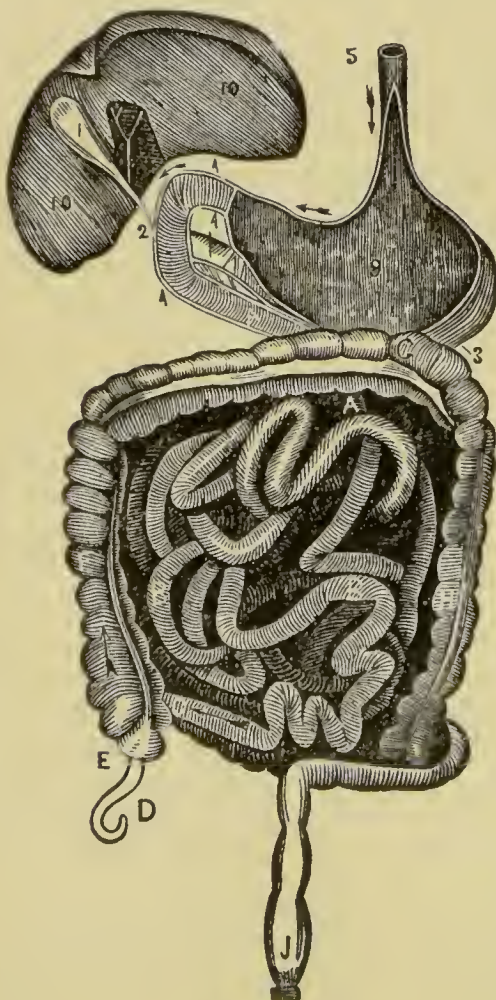


FIG. 62.

**Destination of the Chyle.** — The chyle being separated from the dregs, is pushed onward in its course by the worm-like motion of the intestine; and as it passes along, it is gradually sucked up by thousands of very small vessels, whose mouths open upon the inner surface of the bowel. These little vessels are called *lacteals*, from the Latin word *lac*, which means milk, because they drink this white, milky fluid. Fig. 61 shows a section of the small bowel, turned inside out, and covered with the villi, or root-like filaments, closely set upon its surface, for absorbing the chyle, and at the bottom of which the lacteals take their rise.

In these lacteals, and in the mesenteric glands, the chyle is gradually changed, so as to approach nearer and nearer to the nature of the blood; but precisely what the change is, or how it is effected, is not known. Several



learned men have published their theories upon these points, and the writer has opinions upon them; but it is not worth while to trouble the reader with them. It is sufficient to say that the fluid is carried by the lacteals to the thoracic duct, through which it is conveyed into a large vein at the lower part of the neck, where it is poured into the blood, and becomes, after going through the lungs and experiencing another and a vital change, the material out of which our bodies are daily and hourly new-created.

Fig. 62 gives a general idea of the stomach, bowels, etc.: 9, being the stomach; 10, 10, the liver; 1, the gall-bladder; 2, the duct which conveys the bile to 4, which is the duodenum; 3, is the pancreas; 5, the œsophagus; A, the duodenum; B, the bowels; C, the junction of the small intestines with the colon; D, the appendix vermiformis; E, the cœcum; F, the ascending colon; G, the transverse colon; H, the descending colon; I, the sigmoid flexure; J, the rectum.

### Nature and Destination of Food.

THE food which man requires for his support and development is of two kinds, inorganic and organic. The first of these embraces certain mineral substances, as common salt, sulphur, phosphorus, iron and lime, either in combination or separate.

These are not generally reckoned as aliments, and yet no human being can live without them. In their absence, the body decays, disintegrates, and perishes. Common salt is composed of muriatic acid and soda. The first is an important ingredient in the gastric juice, and the latter promotes the secretion of bile. Sulphur is found in several of the tissues, particularly in the muscles. Phosphorus, united to fatty matter, is highly honored in forming a portion of the brain and nerves, and is also combined with oxygen and lime to make the earthy or hard part of bones.

**Found in Food.** — These articles it is not necessary often to introduce into the system in a separate state. They are contained, in larger or smaller proportions, in most articles of food; and man always suffers, as all animals do, from their absence. Common salt is found in the flesh of animals, in milk, and in eggs. It is not very abundant in plants; and we all know how eagerly domestic animals devour it when it is given to them, and how constantly wild cattle resort to the salt springs, which, in the great West, are called “buffalo licks.” Lime exists in nearly all animal and vegetable substances. In wheat flour we get it in combination with phosphoric acid, that is, as phosphate of lime. Lime exists too, in the state of carbonate and sulphate, in all hard water. Iron is found in the yolk of eggs, in milk, in animal flesh, in potatoes, pears, cabbages, mustard and other articles. Sulphur we get in flesh, eggs and milk; and, as sulphate of lime, in spring and river water. Phosphorus is derived from eggs and milk; and flesh, bread, fruits, and husks of grain,

commonly called bran, contain even a larger proportion than we need in our diet.

**Organic Food.** — The organic elements of man's food, which in bulk embrace almost the whole of it, remain to be considered. In the animal economy they serve two great purposes. A part of the articles which compose them are blood-formers, out of which all the tissues are made, — the other part produces fat, which serves to warm the body by being burned with oxygen. These articles are derived partly from the vegetable and partly from the animal kingdom.

**Divided into Four Groups.** — For convenience, these articles may be divided into four groups. For the first, sugar stands as a type. We therefore call it the *saccharine* group. It embraces starch, gum, and the fibre of wood. These articles may all be converted into sugar by a simple chemical process. Figure 63 gives a microscopic view of the granules of starch.

The *second group* we call the *oleaginous*. It is composed of oily substances, from whatever source derived, whether the animal or the vegetable world.

The *third group* is the *albuminous*. A good type of it is the white of egg.

The *fourth* is the *gelatinous*, or *jelly* group.



FIG. 63.

**First and Second Groups, Supporters of Respiration.** — The articles composing the first and second groups are analogous in composition, all containing *oxygen*, *hydrogen*, and *carbon*. They are what Liebig calls supporters of respiration; the meaning of which is, in more comprehensible terms, that they are *supporters of combustion*. They are the *fuel which warms us*. They keep the fires going, from which arises all the heat we have in our bodies. But they are destitute of nitrogen, and, on this account, they are not blood-formers, and cannot be worked into flesh. Hence, man cannot live on them.

The food articles embraced in the third and fourth groups also contain oxygen, hydrogen, and carbon; and to these they add *nitrogen*. This fourth component part, which forms only a small portion of them, gives them, for some reason never explained, the peculiar quality of producing blood and flesh. They are the raw materials, out of which our bodies are reconstructed from day to day.

Feed a man ever so largely upon sugar, starch, gum, and oils, and he will starve as certainly as if he were allowed nothing but water.

**Names of Two Great Divisions of Food.** — The possession or non-possession of nitrogen, then, is what distinguishes from each other the two great classes of food-articles. Those which contain nitrogen



have been called *nitrogenized*, and those which are destitute of it, *non-nitrogenized* compounds. As nitrogen is often called *azote*, the former class are more frequently named *azotized*; the latter, *non-azotized*.

Let the reader now fix it in his mind that the azotized articles of food produce blood and flesh; the non-azotized, heat; and he will have the key to understand much of what is to be said, and likewise to unlock many of the mysteries of diet.

**Nutrition Table.**—Taking human milk as the standard, and expressing the amount of nitrogen it contains by 100, the following table shows the relative amount of nitrogen in the principal flesh-producing articles of food, and consequently their power of forming the tissues :—

## VEGETABLE.

Rice . . . . .	81	Potatoes . . . . .	84
Rye . . . . .	106	Turnips . . . . .	106
Corn . . . . .	125	Carrots . . . . .	150
Barley . . . . .	125	Peas . . . . .	239
Oats . . . . .	138	Beans . . . . .	320
Wheat . . . . .	144		

## ANIMAL.

Human Milk . . . . .	100	White of Egg . . . . .	845
Cows' Milk . . . . .	237	Herring . . . . .	910
Oyster . . . . .	305	Haddock . . . . .	816
Yolk of Eggs . . . . .	305	Pigeon . . . . .	756
Cheese . . . . .	331-447	Lamb . . . . .	833
Eel . . . . .	428	Mutton . . . . .	852
Pork-Ham . . . . .	807	Veal . . . . .	911
Salmon . . . . .	610	Beef . . . . .	942

**Other Standards of Value.**—We must not infer that those articles which have most nitrogen are necessarily best adapted for human diet because they are the most effective blood-producers. In deciding the value of an article for food, other things are to be looked at besides its nutritive qualities. Those which are poor in nitrogen, are rich in carbon and hydrogen, and are well fitted to serve the double purpose of nourishing and warming the body at the same time. The fitness of an article for diet depends very much upon the ease or difficulty with which it is digested and assimilated. If an article having a great deal of nitrogen, and being very nutritive, is with great difficulty reduced in the stomach by the digestive process, it may be much less desirable for food than one which is digested and assimilated easily, but is much poorer in nutritive qualities.

**Heat-generating Food Articles.**—The reader has before him the principal blood and tissue-forming food articles. Those which we reckon as fuel, or heat-generators, are chiefly oils, sugar, starch, farina, sago, arrowroot, tapioca, gums, etc. These are less essential than the others; for the blood-forming articles have within them the elements out of which fat is formed in the process of assimilation; for

many of them contain starch ; and this, in the human organism, is changed into fat. The amount of starch in some of these articles is as follows : —

Wheat flour, good quality, 100, contains 65 to 66 parts in 100 <i>pure starch</i> .						
Wheat . . . . .	108	“	53	“	56	“ “ “
Barley meal . . . . .	119	“	64	“	65	“ “ “
Barley . . . . .	130	“	37	“	37	“ “ “
Rye . . . . .	111	“	44	“	47	“ “ “
Buckwheat . . . . .	108	“	43	“	44	“ “ “
Indian Corn . . . . .	138	“	65	“	66	“ “ “
Rice . . . . .	171	“	85	“	86	“ “ “
Peas . . . . .	69	“	38	“	39	“ “ “
White Beans . . . . .	59	“	37	“	38	“ “ “

**In the Nutritive Food Articles,** there is a fixed relation existing between the elements of the tissue-formers and the heat-producers which they contain. Out of a few of them Baron Liebig has constructed the following table : —

For every ten parts of blood and tissue-formers there are, —

In Wheat flour,	10 . . . . .	46	In Barley,	10 . . . . .	57
In Rye meal,	10 . . . . .	57	In Rice,	10 . . . . .	123
In Oatmeal,	10 . . . . .	50	In White potatoes,	10 . . . . .	86
In Buckwheat,	10 . . . . .	130	In Blue potatoes,	10 . . . . .	130

**Diet a Complex Subject.** — From the facts and tables now presented, it appears that the question of diet is one of complexity; and that the determination of its several points requires that a number of things should be taken into the account. First, in deciding the usefulness of any article, we may inquire respecting —

**Its Digestibility.**— If an article be not digestible, it is of little consequence how much or how little albumen, starch or nitrogen it may contain. The first and most important inquiry respecting it is, is it *digestible*? If not, it is to be rejected ; for, whatever other qualities it may have, it can only injure the stomach and embarrass the whole system.

\* The following table will be useful to the reader, though I do not set it down as reliable in all cases. There is often a great difference in the ease with which different stomachs will digest the same food. Many stomachs are afflicted with what is called an idiosyncrasy, — a habit, peculiar to itself, of rejecting or refusing to digest some one or more articles which are acceptable to all other stomachs. This table shows the length of time required for digesting the several articles in the stomach of St. Martin, as shown by the experiments of Dr. Beaumont: —



Articles.	Preparations.	Time.	Articles.	Preparations.	Time.
		h. m.			h. m.
Rice	Boiled	1 —	Pork, recently salted	Raw	3 —
Pig's feet, soused	Boiled	1 —	Soup, chicken	Boiled	3 —
Tripe, soused	Boiled	1 —	Oysters, fresh	Roasted	3 15
Trout, salmon, fresh	Boiled	1 30	Pork, recently salted	Boiled	3 15
“ “ “	Fried	1 30	Pork steak	Boiled	3 15
Apples, sweet, mellow	Raw	1 30	Corn bread	Baked	3 15
Venison, steak	Boiled	1 35	Mutton, fresh	Roasted	3 15
Sago	Boiled	1 45	Carrot, orange	Boiled	3 15
Apples, sour, mellow	Raw	2 —	Sausage, fresh	Boiled	3 20
Cabbage, with vinegar	Raw	2 —	Beef, fresh, lean, dry	Roasted	3 30
Codfish, eured, dry	Boiled	2 —	Bread, wheat, fresh	Baked	3 30
Eggs, fresh	Raw	2 —	Butter	Melted	3 30
Liver, beef's fresh	Boiled	2 —	Cheese, old, strong	Raw	3 30
Milk	Boiled	2 —	Eggs, fresh	Hard boiled	3 30
Tapioca	Boiled	2 —	“ “	Fried	3 30
Milk	Raw	2 15	Flounder, fresh	Fried	3 30
Turkey, wild	Roasted	2 18	Oysters, fresh	Stewed	3 30
“ “	Boiled	2 25	Potatoes, Irish	Boiled	3 30
“ domesticated	Roasted	2 30	Soup, mutton	Boiled	3 30
Potatoes, Irish	Baked	2 30	“ oyster	Boiled	3 30
Parsnips	Boiled	2 30	Turnip, flat	Boiled	3 30
Pig, sucking	Roasted	2 30	Beets	Boiled	3 45
Meat hashed with } vegetables }	Warmed	2 30	Corn, green, and beans	Boiled	3 45
Lamb, fresh	Boiled	2 30	Beef, fresh, lean	Fried	4 —
Goose	Roasted	2 30	Fowls, domestic	Boiled	4 —
Cake, sponge	Baked	2 30	“ “	Roasted	4 —
Cabbage-head	Raw	2 30	Veal, fresh	Boiled	4 —
Beans, pod	Boiled	2 30	Soup, beef, vegeta- } bles, and bread }	Boiled	4 —
Custard	Baked	2 45	Salmon, salted	Boiled	4 —
Chicken, full-grown	Fricasseed	2 45	Heart, animal	Fried	4 —
Apples, sour, hard	Raw	2 50	Beef, old, hard, salted	Boiled	4 15
Oysters, fresh	Raw	2 55	Pork, recently salted	Fried	4 15
Bass, striped, fresh	Boiled	3 —	Cabbage, with vinegar	Boiled	4 30
Beef, fresh, lean, rare	Roasted	3 —	Ducks, wild	Roasted	4 30
“ steak	Boiled	3 —	Pork, recently salted	Boiled	4 30
Corn cake	Baked	3 —	Suet, mutton	Boiled	4 30
Dumpling, apple	Boiled	3 —	Veal, fresh	Fried	4 30
Eggs, fresh	Boiled soft	3 —	Pork, fat and lean	Roasted	5 15
Mutton, fresh	Boiled	3 —	Suet, beef, fresh	Boiled	5 30
“ “	Boiled	3 —	Tendon	Boiled	5 30

This table may be considered as giving a general idea of the relative digestibility of the food-articles contained in it. If not found exactly right in each individual case, it can be rectified by experience. The experience of no other individual's stomach will ever be found precisely like that of St. Martin's, — though in its general features, it may be sufficiently similar to make his valuable. The general principles of conduct may be learned from the experience of others. The particular application must come from our own experience and reason.

**Digestibility Influenced by Amount.**—The rapidity with which any article is digested will vary with the amount taken. A larger quantity than is called for by the wants of the system will be digested more slowly than the proper amount; while, on the other hand, an insufficient supply begets an inability to reduce in the stomach even the small quantity taken. We may err in taking too

little food as well as in taking too much; though the former error is much less likely to occur than the latter.

**Choosing Food in Ill Health.**—But in deciding the *kind* and *amount* of food we must be guided not only by its digestibility, but by the state of the health.

If we find the stomach apparently in good working condition, capable of dissolving properly whatever is submitted to its action, and yet we are for some cause losing flesh and strength, we should resort not only to the most nutritious of the albuminous group of the azotized articles, but likewise to the oleaginous group of the non-azotized. We want a great amount of nutriment, and we need oils to make fat. This is the kind of food generally wanted in constitutional consumption.

In fevers, but little food can be disposed of at best; and that little must be chosen with reference to its mildness and its unstimulating qualities. Generally the farinaceous or starchy articles are most suitable, because they have no stimulating and irritating qualities, and especially because they furnish fuel to be burned with oxygen, and thus take the place of the animal tissues, which are being rapidly consumed with this devouring element. In fever, oxygen is literally burning up the body. In this state of the system, this element acquires, by some means, a singular affinity for the tissues; and, uniting with them rapidly, forms a true combustion. The physician who throws to this devouring agent some of the mild, non-azotized articles which offer it stronger affinities than it finds in the tissues, is as wise as he who tosses his dog to a hungry lion to avoid being devoured himself.

**Exercise to be Considered.**—In deciding the diet, the amount of exercise is not less important to be considered than the health. The farmer, who works in the open air, and uses his muscles a great deal, wants considerably more nutritive, as well as more combustive, food than one who leads a sedentary life. Of course there is a great deal more waste of the tissues, and he requires more of the flesh-forming articles; and as he breathes deeper, and takes in more oxygen, he needs more of the supporters of respiration, — the sugars, oils, and starchy aliments.

**Beans.**—By turning to the table which shows the amount of nitrogen in the different food-articles, the reader will see that *beans* are rich in this element. They are, therefore, excellent food for working men, who are obliged to make great use of their muscles. Our fathers, who broke and subdued the rocky soil of New England, showed wisdom even in their instincts in taking so large a portion of their aliment from the bean, — especially as they *oiled* it with the fat of pork. But for the hard-working *student*, who daily makes heavy drafts upon his brain and nervous system, beans and peas are an improper diet. They contain no *phosphorus*, in the shape of



phosphate of lime ; and no brain can work hard without a due supply of phosphorus, which forms a part of its substance.

**Unbolted Wheat Flour.**—For the man who uses his brain a great deal, there is no other *one* article of food equal to bread made from unbolted wheat flour. Fine wheat flour is little better for him than beans, because the miller has robbed it of much of the phosphorus, which is found chiefly in the hull or bran.

I mention only two or three articles of food as specimens. By looking over the tables furnished, and reasoning upon the whole in the way I have done upon these few, the reader can give every article something like its proper value in most circumstances.

**Climate.**—If health and exercise should influence us in choosing the kind and the amount of food, *climate* must do so quite as much.

In the frigid climate of high latitudes, it is necessary that a great deal of heat be produced in the body, in order to avoid perishing with cold. There is no mystery now, as there once was, about the production of this heat. It comes from the burning of carbon and other substances in the body, where they unite with oxygen, and make just as real a fire as that which warms our houses. Oils, sugar, starch, gums, etc., are largely composed of carbon, and readily unite with oxygen in the body. This is the reason they are reckoned as *fuel*, and are called *supporters of combustion*. And *for this reason*, they require to be largely consumed in very cold climates. The instincts of men seem to lead to the same conclusion, for the dwellers in all high latitudes consume great quantities of oils and fats. The amount of train-oil, tallow, the fat of seals and other animals, devoured by the Laplanders, Kamtschatkans, and other northern people, is truly wonderful.

In hot countries, the fundamental rule for preserving the health is to keep the body cool. Without observing this rule, the strongest will often fall victims to the climate in low latitudes. But to keep cool, of course all the heat-producing articles of food should be avoided. Particularly all alcoholic drinks, which are powerful supporters of combustion, should be rejected. Rice and the various fruits form the most suitable articles of diet.

The great sacrifice of life witnessed among the early emigrants to California, was the result chiefly of using ardent spirits and heat-producing food while crossing the Isthmus, which, to a northern constitution, is much like a vast oven, heated to a temperature suitable for baking bread. There are few persons, with tolerable health and strength, but could safely endure the hottest climate if they would avoid alcoholic liquors and confine themselves to an abstemious vegetable and fruit diet.

**Bayard Taylor's Opinion.**—The distinguished traveller, Bayard Taylor, reports that while spending a few days in a heated part of Africa, he lived as the inhabitants did, pretty much entirely upon the

flesh of well-fatted sheep ; and that he enjoyed, meantime, excellent health and strength. From this he concludes that animal food is as suitable in hot climates as in cold.

It is a pity a man of such excellent parts as Mr. Taylor should have allowed himself to rear so tall a structure upon so narrow a foundation. That he could live on flesh in so hot a region, and not be made sick, only proved that he had a fine constitution, and that his health was not easily disturbed ; and when he attempted, from his limited experience of a few days, to reason against the established facts of science, and against the well-attested laws of life, he did it evidently without reflecting that he was in a field of thought which he never had occasion to cultivate.

The great Jewish Lawgiver doubtless had a reason for prohibiting pork to the Jews. Whatever that reason was, the prohibition had a wise bearing upon the health of the people. Palestine has a hot climate, in which pork-fat is an improper diet.

**More Fat in Winter.**—It follows from what has been said, that a more fatty as well as stimulating diet is needed in winter than in summer. But the change should be made gradually. When cold weather approaches, the food should become more nutritious and warming by little and little. The exercise should likewise be increased.

Even the lower animals act upon this plan. In the fall, squirrels eat nuts, which are full of oil, and grow fat upon them.

The instincts of men move in the same direction. It is in the fall that the hog, the ox, and the poultry are killed ; and in the winter that they are largely feasted upon and enjoyed. Upon such food, combined with various sorts of starch, man fattens ; and a good supply of fat, deposited in the cells, is equal, in keeping out cold, to a layer of cotton batting, — to say nothing of the fire kept up within the body by the burning of such fuel. As hot weather comes on, we gradually lay aside these fattening articles (or ought to), and return to the watery vegetables and fruits, such as squash, string-beans, strawberries, currants, etc.

Few of us, I apprehend, would suffer from heat in summer, if we could persuade ourselves to abandon stimulating and fire-producing food, and confine ourselves pretty much to a cooling and succulent diet. Diarrhœas in summer are not induced by eating wholesome vegetables, but by combining them with large quantities of animal food.

**The State of the Mind.**—This should by no means be overlooked in choosing the kind and the amount of food. If we have lost friends, or heard desponding news, or experienced calamities of any kind, we must, during the first hours of the shock, or even during the first days, if the affliction be heavy, partake very sparingly of food. The stomach is in no condition to receive it. The brain lies pros-



trate under the stroke, and the stomach, in sympathy with it, asks for a day of sorrow and fasting. Disturb it not.

**Heat-producing Food Incompatible with Excitement.**—It is folly to take heat-producing aliment when laboring for days under high excitements. During political campaigns, when the blood of politicians is at the boiling point, the diet should be unstimulating, — containing very little animal flesh, and not much combustive food. Many a man has died of apoplexy, or of heart-disease, by putting on the steam when his blood was up. Whenever we have a day of uncommon excitement to pass through, we should always begin and end it with an unusual degree of abstinence as to the amount of food taken, and with special care that the articles be of the highest kind.

**Anger Demands Abstinence.**—Anger is a passion which especially unfits the stomach for doing much work. If it occur often, or be protracted, but little food should be taken. Those who indulge it have a double cause for abstinence. Both their folly and their stomachs call for a fast.

**Food Adapted to Different Periods of Life.**—Food must vary in different periods of life. The infant needs a fattening diet; and this has been supplied in the milk of the mother, which contains more *butter* (the fattening portion) than the milk of any other animal. But as the infant has much less exercise than the young of animals, its flesh is not wasted, and it does not require so much *azotized* food, that is, the reader will remember, food with *nitrogen in it*. Accordingly, it will be seen by looking at the table on page 70, that human milk has much less of this element than that of the cow. As the child grows up, and begins to take active exercise, indoors and out, it wants more solid food, and teeth make their appearance to masticate or chew it.

**In Youth and Manhood**, the great amount of exercise usually taken calls for larger supplies of azotized aliment, — beef, mutton, pork, fowl, fish, wheat-flour, corn-meal, rye-meal, potatoes, turnips, peas, beans, etc. This is the working part of life, when the tissues are rapidly wasted by action, and the *flesh-forming aliments* are wanted to keep them good.

**In Old Age**, the exercise is diminished, the blood circulates more slowly, and the body grows cold. Now is the time to resort to *non-azotized* food, — oils, fats, the various kinds of starch, sugar, and the like. These will furnish fuel to warm the sluggish blood, and will invest the body with fat, which will serve the purpose both of a cushion and a garment. Wine, beer, porter, and distilled spirits are never needed by young persons in health; but the aged are frequently benefited by them, if taken in small quantities. They are chiefly composed of oxygen, hydrogen and carbon, and are properly ranked with

the supporters of combustion. They are likewise stimulant, and add to the comfort of the old by quickening their circulation. Like tea and coffee, they diminish the waste of the body, and thereby lessen the demand for food.

The smallest amount of aliment upon which a healthy adult person ever lived for any length of time, was twelve ounces a day. Upon this small daily allowance, Lewis Cornaro, a noble Venetian, subsisted in perfect health, during the protracted period of fifty-eight years. This he was able to do only by adding daily to his food about twelve ounces of light wines. I shall have occasion to refer to this case again.

### Cost of Food.

ONE other consideration must ever influence the great majority of men in selecting their food. I mean its cost. It is a matter of great importance to the poor, to know what kinds of food they can subsist upon with least expense. Sometimes provisions are so high that persons in poor circumstances greatly need advice in this matter. Let me endeavor to furnish some information which shall be of service to the reader.

**Milk** is supplied by nature to be our first food, and is a good type of all alimentary substances. It contains *curd*, which has nitrogen, and is equivalent to albumen and fibrin, and represents the *blood-formers*. It has butter and sugar. These represent the *heat-formers*. It has salts, which contain potash, soda, phosphorus, etc. Fig. 64 is a microscopic view of good milk; Fig. 65, of poor milk; and Fig. 66, of milk adulterated with calf's brains.

Food will be valuable in proportion as it combines, in due proportion, the articles contained in the four groups, represented by *albumen*, *fat*, *sugar*, and *salts*.

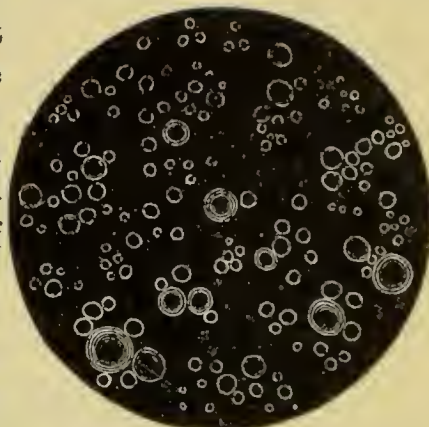


FIG. 64.

**Albuminous Group.**—Albumen, fibrin, casein, and gluten, all enter into the substance of animal and vegetable bodies, and are all composed of the same elements, namely, 48 parts carbon; 36 of hydrogen; 14 of oxygen; and 6 of nitrogen. In containing nitrogen they all differ from the other three groups. Albumen being a good type of them, they are called albuminous compounds. Albumen forms a large portion of the serum, or colorless part of the blood. It is the leading principle in alimentation. It is worked up into the tissues of our bodies. It forms our muscles, our membranes, a portion of our nerves, etc. It is the bricks of which the house we live in is made. All the articles, therefore, which are chemically constituted like it, may well be termed albuminous.



These bodies, consisting of the four organic elements named above, have been called *quaternary compounds*. Besides these elements, they have a minute portion of sulphur and phosphorus. They are also called *protein* or *proteinaceous compounds*.

Albumen is a very unstable compound,—tending strongly to decomposition. This is owing to the complexity of its composition,

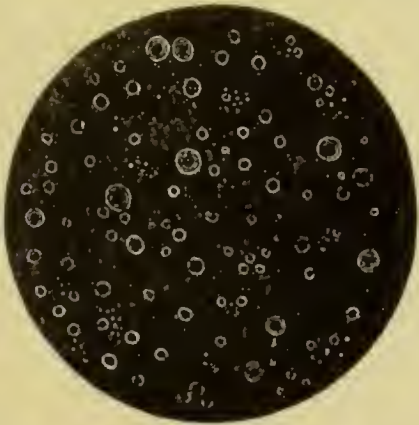


FIG. 65.

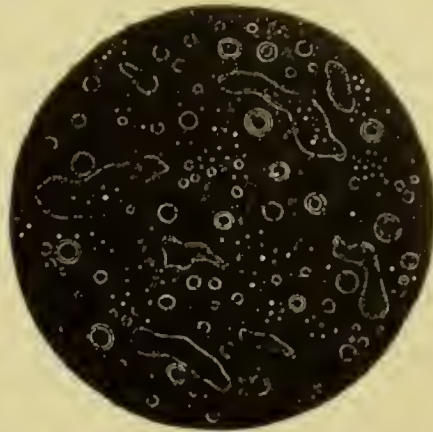


FIG. 66.

and to its union with the fickle element, nitrogen, which forms chemical compounds reluctantly, and breaks them without remorse. Substances which coagulate or fix albumen in an insoluble compound, or preserve the tissues of the body, which are made from it, from decomposition or putrefaction, are called *antiseptics*.

**Fatty Group.**—The next group, represented by fat, performs very important offices in the system,—the most important of which is a union with albumen in the formation of cells. All animal and vegetable life begins with the cell,—the tiny cup, with which nature dips all the streams of life out of the great fountain of inorganic matter. No cell is formed without a minute particle of oil. The portion not used in forming cells, is either burned as fuel to keep us warm, by uniting with oxygen, or it is stored away in the cellular tissues, adding to the bulk of the person. If, then, the very beginnings of life are dependent upon fat, it is of great importance as an article of diet. So necessary is it in the economy of life, that when not taken in the food, it is formed out of albumen in the processes of assimilation.

**The Starch and Sugar Group**, composed of several kinds of sugar, gum, etc., is never used in forming the tissues, but they perform important offices in the changes going on within the human organism. Thus, sugar of milk is decomposed, and forms lactic acid, so called from being found in sour milk. This acid plays a very important part in the process of nutrition.

Pure starch is a snow-white powder, having a glistening aspect. It is composed of grains from  $\frac{1}{300}$  to  $\frac{1}{3000}$  of an inch in diameter in the different grains; being largest in the potato and smallest in wheat. When examined with the microscope, they appear as in Fig. 63.

The Salts Group are sufficiently spoken of in another place.

A wise philosopher in ancient time said, "I do not live to eat and drink; I eat and drink to live." If we intend to eat to live, we must combine, in our food, the four groups above explained; and if we would live at as small expense as possible, we must take those articles which are low in price and rich in nutritive matter. The following table will help the reader make his selections:—

Table of the relative value of articles of food arranged according to their proportions of nutrient matter in each of the four groups of elements concerned in vital changes.

In 100 pounds of	Water.	Husk or woody fibre.	1st Group. Albuminous substances.	2d Group. Fats.	3d Group. Starch and Sugar.	4th Group. Salts.
GRAINS:						
Wheat . . . . .	15	15	10 to 19	2 to 4	55	2
Barley . . . . .	15	15	12 to 15	2 to 3	60	3
Oats . . . . .	16	20	14 to 19	5 to 7	60	4
Rye . . . . .	12	10 to 20	10 to 15	3 to 4	60	2
Indian Corn . . . . .	14	6	11	8.1	74	1½
Buckwheat . . . . .	15	25	8	0.4	50	4
Rice . . . . .	13	3	7	0.7	79	0½
POD PLANTS:						
Beans . . . . .	14	8 to 11	24 to 28	2 to 3	40	3
Peas . . . . .	14	9	24	2.1	50	3
ROOTS:						
Potato . . . . .	75	4	2.1	0.3	18	¾ to 1½
Turnip . . . . .	88	2	1.5	0.3	9	½ to 4.5
Carrot . . . . .	85	3	1.5	0.4	10	1½ to 2
Beet (mangold wurzel) . . . . .	85	2	2		11	¾ to 1
Long red . . . . .	85	3.03	0.48		10.36	1½
Short red . . . . .	85	3.31	0.26		12.46	.75
Sugar beet . . . . .	85	2		0.35	13	
Parsnip . . . . .	80	1.5	2.5		16	½
LEAF:						
Cabbage . . . . .			30 to 35			
MEAL:						
Wheat flour . . . . .	15		10.8	2	70.5	
Ryemeal . . . . .	15	4.63	8	2	73	2
Barleymeal . . . . .	15		6.3	2.4	74	2
Oatmeal . . . . .	15		12.6	5.6	64	3
Wheat bran . . . . .	13.1	55	19.3	4.7	.6	7.3

The following tables have an admirably practical bearing upon economy in food:—

100 lbs.	Muscle-forming Elements, in lbs.	Fat-forming Elements, in lbs.	Relative Proportion of each, in lbs.	Husky, or Woody fibre, in lbs.
Barley . . . . .	14	64	1 to 4½	15
Beans . . . . .	26	42	1 to 1½	10
Beets . . . . .	2	12	1 to 6	(?)
Buckwheat . . . . .	8	54	1 to 6¾	25
Carrots . . . . .	1½	10	1 to 6¾	3
Corn . . . . .	12	77	1 to 6½	6
Oats . . . . .	17	66	1 to 4	20
Peas . . . . .	24	52	1 to 2½	8
Potatoes . . . . .	2	19	1 to 9½	4
Turnips (field) . . . . .	1½	9	1 to 6	2
Do. (Swedish) . . . . .	2½	12	1 to 5½	2
Wheat Flour . . . . .	11	79	1 to 7	
Wheat Bran . . . . .	18	6	1 to ½	55
Cheese (whole milk) . . . . .	28.4	51.1	1 to 1¾	
Cheese (skim-milk) . . . . .	49.8	6.3	1 to ½	



Articles.	Cost.	Muscle-producing Elements.	Cost of Muscle-producing Elements.
Barley . . . . .	\$1.00 per bu.	8.4 lbs.	12c. per lb.
Beans . . . . .	1.80 "	16.6 "	11c. "
Corn . . . . .	0.50 "	6.7 "	7½c. "
Oats . . . . .	0.35 "	5.2 "	7c. "
Peas . . . . .	1.00 "	14.3 "	7c. "
Potatoes . . . . .	0.85 "	1.6 "	53c. "
Turnips . . . . .	0.50 "	1.2 "	41c. "
Flour (fine) . . . . .	5.00 per bbl.	22.0 "	23c. "
Flour (unbolted) . . . . .	4.50 "	24.8 "	18c. "

These tables will well repay study, for their practical use will save many dollars to the poor. Let it be remembered that producing muscle is the same thing as producing strength, or *labor-power*. Bearing this in mind, the following table will be very interesting:—

One pound of labor-power from				Potatoes costs	53c.	per lb.
"	"	"	"	"	Fine Flour,	23c.
"	"	"	"	"	Unbolted do.,	18c.
"	"	"	"	"	Turnips,	41c.
"	"	"	"	"	Barley,	12c.
"	"	"	"	"	Corn,	7½c.
"	"	"	"	"	Beans,	11c.
"	"	"	"	"	Peas,	7c.
"	"	"	"	"	Oats,	7c.

**Meats** are omitted in the table. So far as their nutritive qualities are concerned, it is of little consequence which are taken. Some are more digestible than others, and this consideration should influence those with weak stomachs in selecting. Every person, of course, knows their relative cheapness.

Among the vegetables given in the table, there is a wider range for choice. Let us consider them in course.

**Wheat.**—In this, the four groups are represented in excellent proportion. When not deprived of the bran, it is perhaps the very best supporter of animal life. So high have been the regards of men for it, and so generously have they awarded to it their acknowledgments, that its product, bread, has been everywhere called "the staff of life." The settlement and cultivation of the immense prairies of the West have within recent years so increased the production of wheat, that its cost is now less than half what it was fifty years ago, and it is indeed within the means of all in America.

**Barley.**—This has the four groups represented in nearly the same proportions as wheat. It is, therefore, nearly as valuable an alimentary grain. Unfortunately it is not so toothsome as wheat, and can never be so popular an article of diet. The Scotch, however, feed upon it with apparent relish, and doubtless think it strange that foreign palates are not better pleased with it.

**Oats.**—This grain, strange to say, has more albuminous, or nutritive matter, more fat, more starch, and more salts than wheat. In uniting a large quantity of the four alimentary groups, it surpasses

every other vegetable substance. In albumen, it is not quite as rich as peas and beans, and in starch it falls a trifle below fine wheat flour; but in fat it is exceeded only by Indian corn. This grain is likewise consumed largely by the Scotch,—a people whose claims to shrewd common sense are well supported by, as their hardy constitutions vindicate, the choice. This grain might well be permitted to take the place of rice. It affords several times as much nutriment, while it costs only about one-fifth as much. There is good reason why the horse should thrive upon oats. Most stable-keepers think their horses will do more work upon corn-meal, but this must be a mistake. In using oats for horse-feeding, a large portion of the nutriment is lost by not *grinding* them.

**Rye.**— This is also a grain of considerable nutritive value. It is much cheaper than wheat; and rye meal has long been a standard article of diet in New England, — particularly in connection with Indian meal, as “brown bread.” It is useful for relieving costiveness, in the form of “hasty-pudding,” with molasses.

**Indian Corn.**— This staple article of American produce needs no praise from me. It is comparatively cheap, nutritive, and wholesome. It abounds in fat and starch, and has a fair amount of albumen, though not as much as the oat, the barley, or the wheat. In salts, it is rather deficient. Indian corn is strictly an American plant, and is perhaps the most popular grain in the country. It has emphatically a national reputation, and is perhaps worked up into more savory dishes than any other. At the South it is an institution. It is there made into hoe-cake, corn-cake, batter-cakes, batter-bread, muffins, corn-pone, etc. At the North, we have johnny-cake, Indian and pumpkin-cake, baked Indian pudding, boiled Indian pudding, beside the well-known rye and Indian bread, and other preparations. Give an ingenious Southern or Northern housewife a few simple adjuncts, such as lard, milk, sugar, eggs, cream of tartar, and soda, and she will make a pretty respectable larder from this single grain. If molasses be substituted for sugar, and a little stewed pumpkin be thrown in by way of garniture, we may have several preparations which are very nourishing as well as cheap.

**Buckwheat.**— Poor in nutritive matter, fat, starch, and sugar, but tolerably well supplied with salts. It will do very well for batter-cakes in winter. When brought smoking upon the table, and served with sugar or molasses and butter, these cakes are a luxury, in which the rich may indulge if they choose; but for the poor, the amount of nourishment they afford is too small for their cost.

**Rice.**— Much like buckwheat, except that it has more fat, sugar, and starch, and less salts. As an article of diet, it has had too high a reputation. Those who would live on small means cannot afford it. Boiled in plain water, it is excellent for a relaxed state of the bowels; and this about all the commendation to which it is entitled.



**Beans.**— The richest in nutritive matter of all vegetable substances, except cabbage and oats. They have more albumen than wheat, or corn, or barley, or oats; but in fat and starch they are lower in the scale. Add to them salt pork, and the highest of all nutrient compounds is obtained. During not less than four generations, pork and beans, as the principal diet, nourished an iron-sided race of men in New England. Bean-porridge was like honey upon the tongue of the founders of New England institutions. They ate it morning, noon, and night; and thanked God for it every time. And well they might thank Him; for, with Indian corn, it furnished them with a diet better adapted to their condition than any other.

**Peas.**— Not quite as rich as beans in albumen, but more rich in starch, is of about the same value on the whole. The Canadian French, in Lower Canada, feed on peas to about the same extent that the New Englanders did on beans. Pea-soup, as prepared by the best cooks among them, is a dish of great nutritive excellence; and, in my judgment, more palatable than bean-soup.

**The Potato.**— Three-quarters of this root is water, and it is poor in all the elements of nutrition. It is a palatable article, and most persons are much attached to it. As *bulk* is of some consequence in food, the potato is not without value. Men do not often live entirely upon potatoes,—not even in Ireland. Milk, butter-milk, and especially cabbage, are united with them.

**Turnips, Carrots, Beets, Parsnips.**— These are much alike,—being all poor in nutritive qualities. They serve to please the palate by furnishing a variety; but in our city markets they are expensive, and do not furnish an economical diet.

**Cabbage.**— It is interesting to observe how the instincts of men have in all ages led them to select those articles of diet which their circumstances have demanded. The poverty of the Irish has led them to subsist largely upon the potato,—a root which the soil of their country yields profusely. But as this root has but little nutritive matter, necessity required that it should be united with some other vegetable. The natural instinct selected the cabbage; and when chemical science came, at length, to pass judgment upon the correctness of this instinct, it turns out that the cabbage is the richest in albumen of any known vegetable. The cabbage, then, is the natural complement of the potato; and the Irish had the sagacity, without science, to bring the two together. It is said the Irish have a dish named “kohl-cannon,” consisting of boiled and mashed potatoes and cabbage, seasoned with pork fat, pepper, and salt, and that it is a truly savory dish. It certainly is a nourishing and a cheap one. The ambassador who was sent to tamper with the patriotism of a Roman who had dined on beans, was asked if he was silly enough to think gold and silver could bribe a man who was satisfied with so plain a

fare, and desired no other. We come to the conclusion then, that bean-porridge, pea-soup, suet-pudding sweetened with molasses, oat-meal, and barley-bread, with "kohl-cannon" for those who can digest it, will furnish, for hard-working men, the most substantial diet, at the smallest possible expense. To render these dishes savory, and to make the table on which they are spread an inviting board, the deft housewife must employ her best skill in serving them. With the thousand "fixings, with which a New England matron knows how to garnish them (or would know how if they came within her culinary operations), they are well fitted to leave savory impressions upon tongues which would praise them to the end of life. I speak of these articles as furnishing a cheap diet for working men. The indolent, the sedentary, and the effeminate from various causes, could not digest them.

### The Amount of Food Taken.

WE have already explained that this should be governed, in part, by the amount of exercise taken, by the condition of the health, by the state of the mind, by the climate, by the season, etc. It remains to add a few words in a general way, respecting the absolute amount required by an adult man.

It is plain enough that most men eat too much. We come very near, in this country, being a nation of gormands. A principal reason of our over-eating is, that we eat so fast. When the food is well and slowly masticated and swallowed, the gastric juice has time to mix with it; and at the proper moment the appetite ceases. But when our food is bolted rapidly, nature, finding her laws disregarded, and all her purposes frustrated, stands back, and lets us learn to stop, too late, alas! from a sense of fullness in a stretched and abused stomach.

It has already been stated that Lewis Cornaro lived fifty-eight years, namely, from the age of forty-two to one hundred, on twelve ounces of solid food a day, with about the same amount of light wines. At the age of eighty-four he wrote a book, in which he praises "divine temperance" in terms which are sometimes eloquent and often enthusiastic. Indeed it is very rare that a man at that age retains such clearness of intellect, and especially such freshness of feeling as he evinces in his book. Probably but few could live on the amount of food which he found sufficient. Yet it is said the distinguished John Wesley lived on sixteen ounces a day, which, as he took no wine, and had to derive the combustive materials for warming the body from the food, was quite as scanty a fare as that of Cornaro. Considering that he led a most extraordinarily active life, both of body and mind, being half his waking hours in the saddle and preaching almost daily, this is probably the most remarkable case of abstemiousness on record. Jonathan Edwards did not, I think, exceed the same amount of food, but he was not so active a man.



Putting aside such exceptional cases as these, we may say in round numbers, that a laboring man requires, to keep him in health, about two or two and a half pounds of solid food per day. For ministers, lawyers, doctors, authors, and merchants, one pound and a half is amply sufficient. The amount should be increased a little by a selection from some of the fuel-formers, if no fermented or alcoholic drinks be taken, and slightly diminished if they are used. The reason is that these drinks furnish fuel to be burned in breathing, which has to be drawn from the food when they are not employed. This furnishes no motive for *using* ardent spirits; for there is fuel enough to be had in the oils, starches, and sugars.

**Dyspeptics.** — It is said that dyspeptics eat more than persons in health; and, in many cases, the remark may be true. The appetite of a person suffering from this disease is almost always morbid, and the information it gives respecting the real wants of the system can seldom be trusted. If we allow a diseased stomach to dictate to us when and what and how much we shall eat and drink, our misery for life is a foregone question. A sick stomach is like a spoiled child, — it cries for what it should not have. If the dyspeptic will live, and enjoy any amount of peace and comfort, he must follow this simple rule: *To eat no more than can be digested, even though the amount be only an ounce a day.*

### Animal and Vegetable Food.

It has generally been supposed that it was intended man should subsist on a mixed diet, consisting of both animal and vegetable substances. Within the last fifty years, however, a school of physiologists have appeared, who affirm that a vegetable diet is alone consistent with the laws of health. They declare that animal food is not adapted to man's organization, — that it unduly stimulates the blood, predisposes to fevers, consumptions, diarrhœas, choleras, apoplexy, and numerous other diseases, and of course shortens life. That such a school should have come into existence in this country, where animal food is more largely consumed than in any other part of the world, in proportion to the number of people, is not surprising. We do, undoubtedly, eat too much flesh. So enormous is the consumption, that notwithstanding the vast herds of cattle raised in all our agricultural states, and especially on the western plains, the demand keeps up with the supply so well that beef brings, on an average, about twenty cents per pound, — at least twice its full value as a blood-former.

Facts show that man may live upon flesh alone, upon vegetables alone, or upon flesh and vegetables combined. Is it *best* he should subsist upon vegetables only, or upon a mixed diet? A mere affirmation upon these points is of little consequence. To cite facts avails nothing. Men have a way of making their own affirmations, and of

looking at facts with eyes which sometimes see clearly enough on both sides of them, but totally ignore their existence.

**Man's Structure Settles the Question.**—To settle this matter, we must appeal to man's organization. His structure will tell us something we need not mistake. All the works of God show design. Everything he has made has a use, and is so contrived as to be adapted to that use. Lions, tigers, and other animals, for example, which feed on flesh alone, have a *short* second stomach, — it being only about three times the length of the animal's body. Animals which eat no flesh have a long second stomach, — that of the sheep being from thirty to thirty-five times the length of its body. A very remarkable difference of anatomical structure!

This is the meaning of the difference : Vegetable food has a great deal of waste matter in it. Woody fibre makes quite an item in its composition. This waste portion must be carefully separated from the nutritive part, and this must all be done in the second stomach. It takes time to do it. It must not be done in a hurry. The nutritive materials are destined to build a living structure, whose duration, like that of all other fabrics, will depend on the care with which the materials are selected and put together. The second stomach of the sheep is long, that there may be ample time for the mixed mass of chyme, when it passes out of the first stomach, to be changed to chyle, and then to be carefully separated into the two parts, the useful and the useless. Animal food is in its composition just like our own flesh, — there is little waste matter, and not much time is required for its separation ; hence, the second stomach of flesh-eating animals is short. Nearly the whole alimentary mass is quickly taken up by the lacteals, and there is no occasion for its travelling through a long second stomach.

*Man's* second stomach is in length midway between that of the flesh-eating and the vegetable-eating animals. If there be design in the works of the Creator, and if that design in the structure of the flesh and vegetable-consuming animals has now been correctly interpreted, it is plain that man is best nourished when he eats both kinds of food. The structure of his teeth and the motions of his jaws (see p. 30), confirm the same conclusion.

**Americans Eat too Much Meat.**—Yet, as I have said, there is no doubt the Americans eat too much meat. Sedentary persons require but very little. Less is wanted in summer than in winter,—in warm climates than in cold. People of wealth, whose circumstances impose no bodily hardships, need less than the poor, who are much exposed, and work hard ; whereas, they consume more. Those who do not labor with their hands, should never taste meat more than once a day.

It is painfully-amusing (if such a compound word is admissible) to hear a nervous female, whose sole exercise consists in going from



the parlor to the kitchen once or twice a day, and in making a brief shopping excursion once a week, complain that she cannot maintain her strength unless she eats freely twice a day of meat, and takes her free potations of strong coffee and wine.

A like opinion prevails generally among the feeble who are not obliged to labor. The child in its nurse's arms must daily, it is thought, suck a piece of chicken or beefsteak in order to thrive. Children thus fed have their blood constantly inflamed, and stand a poor chance when attacked by scarlet fever. The little master or miss who attends school complains of headache, and grows pale, feeble, and nervous. The books are blamed and thrown aside for what the dishes have done. The doctor is called in and assured that the dear child can eat nothing but a little fat broth, a custard, or cake; and if he prescribe a diet of plain bread and milk, he is believed to be heartless, and his prescription is not followed.

**The Majority of Mankind Eat no Flesh.**—All such misguided persons should be apprized that the great majority of mankind eat no flesh, because they cannot afford it. And they do not appear to suffer from its loss. Millions of Irish do not taste of flesh or fish from one month's end to another. Potatoes, oatmeal, and cabbage constitute their chief diet. Rice, poor as it is in nourishment, sustains, when combined with vegetable oil, millions of people in Asia. The Lazaroni of Naples, with active and finely moulded forms, live on bread and potatoes. These facts do not afford ground for altogether rejecting animal food, any more than Bayard Taylor's statement respecting whole tribes in Africa who live upon flesh furnishes a reason for excluding vegetable aliment. Man may live and enjoy health upon either, but his organization implies the use of both.

### Proportions of Animal and Vegetable Food.

UPON this subject, it is impossible to fix any absolute rules. This is a point which must be determined by the temperament, the state of the health, the constitution, etc. Persons of a scrofulous habit should eat freely of animal food. But an inflamed stomach should never be tormented with flesh. Meat is stimulating, and will be almost sure to do mischief when there is heat and tenderness at the pit of the stomach. There are cases of inflammation of this organ, in which it may be necessary to live on bread and milk, with articles of the *starch group*, for months, and even for years.

On the other hand, when the system has run low from some exhausting disease, which excites no feverish action, it may be necessary at times to take a diet almost exclusively animal.

It is absurd to talk of the same diet as adapted to all persons, even when in health. As well might we expect one shoe to fit every foot, or one coat every back, or one color every eye, or one doctrine every mind.

**Temperance the Main Thing.** — After all, the great thing to be aimed at is temperance. It is not so necessary to reject one article and use another, as to partake of all with moderation, "I do not live to eat and drink; I eat and drink to live," said a wise philosopher of the olden time. One would think the moderns have reversed this rule. A modern table has the appearance of being spread for the purpose of inducing men to eat all their stomachs will hold. A man who can dine daily, for half a dozen years, at one of our first-class hotels, and then find himself free of dyspepsia and all other diseases, must have a fine constitution, as well as most admirable control over his appetite. Mr. Addison said, "When I behold a full table set out in all its magnificence, I fancy I see gout, cholic, fevers, and lethargies lying in ambuscade among the dishes"; to which he adds, with much truth, in another place, "Abstinence starves a growing distemper."

**Good Results of Temperance.** — A temperate diet has always been attended with excellent results, and always will be. There are times of great anxiety, when abstinence should be pushed to the extreme verge of endurance. During the siege of Gibraltar, Lord Heathfield, its gallant defender, lived eight days on four ounces of rice per day. Dr. Franklin, when a journeyman printer, lived two weeks on bread and water, at the rate of ten pounds of bread a week, and was stout and hearty. Dr. Jackson, an eminent physician in the British army, says, "I have wandered a good deal about the world, and never followed any prescribed rule in anything; my health has been tried in all ways; and, by the aid of *temperance* and hard work, I have worn out two armies, in two wars, and probably could wear out another before my period of old age arrives."

Lord Bacon was right in the opinion that intemperance of some kind or other destroys the bulk of mankind, and that life may be sustained by a very scanty portion of nourishment. Cornaro, whom I have before mentioned as having lived fifty-eight years on twelve ounces of solid food a day, wrote as follows respecting himself in his eighty-fifth year: "I now enjoy a vigorous state of body and of mind. I mount my horse from the level ground; I climp steep ascents with ease; and have written a comedy full of innocent mirth and raillery. When I return home, either from private business or from the senate, I have eleven grand-children, with whose education, amusement and songs I am greatly delighted; and I frequently sing with them, for my voice is clearer and stronger now than ever it was in my youth. In short, I am in all respects happy, and quite a stranger to the doleful, morose, dying life of lame, deaf and blind old age, worn out with intemperance." Howard, the philanthropist, fasted one day in the week; and Napoleon, when he felt his system unstrung, suspended his meals, and took exercise on horse-back.

Nothing can be plainer than the duty of fasting, when the stomach, having been overworked, is disinclined to receive food.



Brutes invariably follow this suggestion of nature; they never eat when sick,—probably because they have no silly nurses to coax them to swallow stimulating aliments. The habit of putting high-seasoned food into the stomach when it is inflamed and feverish is about as wise as directing streams of blue, violet, or red light into the eye when it is red and swollen with inflammation.

### Tea and Coffee.

It is proper, before closing this chapter upon diet, that something should be said respecting the beverages of tea and coffee.

Some years ago, a meeting was held by the leading physicians of a city in the old world, in which the merits of tea and coffee were discussed. In this discussion each man first stated his experience in the use of these articles, and then constructed his argument according to that experience. The amount of what the reader could learn from the discussion was that Dr. A. had used tea all his life, and been benefited by it, while coffee had uniformly injured him; and that he thought tea should be used, while coffee should be rejected; that Dr. B. had taken coffee at breakfast, and found it an excellent support to the stomach and nervous system, while tea had disturbed his digestion and his mind; and that the former was a beverage of excellent qualities, while the latter was detestable; that Dr. C. had always drank both tea and coffee, and recommended them to everybody; and that Dr. D. had himself never been able to indulge either tea or coffee, and would have them both expelled from every household.

The discussion was not creditable to the learned and really able men who participated in it. The arguments were all based upon the miserably narrow basis of single individual experiences. They were no more valid than that of the man who should hold up a shoe, declaring it fitted his foot the best of any he ever had, and recommending all men to have their shoes made upon the same last.

The truth is, there is but one thing which can be affirmed universally of the effect of tea and coffee. They both, when taken, tend to prevent waste in the body, and, consequently, less food is required when they are used. This may be affirmed of them in their applicability to all persons, but nothing further. The truth is, some can drink tea but not coffee, and some coffee but not tea; some can use both, and some neither. Every man's susceptibility to the effects of these beverages is his own, as much as his susceptibility to the effects of light, or heat, or atmospheric changes; and these effects, each person must learn from experience. Coffee often produces, and generally aggravates, a bilious habit,—an effect which cannot, I believe, be traced to the use of tea. I have no doubt but that many cases of confirmed dyspepsia are traceable to the use of coffee alone.

## Water.

THERE is one universal beverage; it is water. All men are fond of it. In sickness and in health, in joy and sorrow, in summer and winter, in cold climates and in hot, man loves and drinks water. The stomach, abused and made sick by stimulating food and drinks, and repelling everything else, still gratefully opens itself to water. Wherever man exists, therefore, or wherever he should exist, water is found, either in the form of springs, or running brooks, or rivers, or ponds, or lakes; and even where it is not found in some of these forms, it is periodically dropped down from the clouds. As there is no element in nature more necessary for man's existence than water, so there is none more universally diffused.

**Pure Water Essential to Health.**— But water varies very materially, both in its physical qualities, and in its adaptation to its purposes. Pure water is as essential to health as pure air. When either of these fluids is rendered impure by mixture with foreign matters, disease will be a frequent result. The ancients must have been influenced by this fact, or they would not have incurred such heavy expenses in procuring pure water from great distances. The strong aqueducts through which, for many miles, large streams of water are even at this day poured into Rome, attest the freeness of the expenditures she made for this purpose in the day of her greatest renown. We may pity the ancient Romans for being governed in their military operations by the opinions of augurs and soothsayers, and certainly these things were silly enough; but in other things, at first view equally superstitious, they showed practical wisdom. Vetruius reports that in selecting the sites of their cities, they inspected the livers and spleens of animals to learn the salubrity of the waters and the alimentary productions of the region. The size and condition of these organs do in fact indicate the nature of the pasturage and the qualities of the water with which animals are supplied. No people can enjoy good health when subjected to the double influence of bad water and impure air.

**Division of Water.**— The simplest division of water is into two kinds, soft and hard. Rain, river, pond, and snow water is soft: well and spring water is generally hard. Soft water contains but little impurities, and when used for washing, forms a good lather with soap. Hard water contains at least one of the salts of lime, often more; mixed with soap, it curdles and turns white. The reason of this is, that the oily acids of the soap unite with the lime, and form a compound which the water will not dissolve. Such water is not suitable for domestic purposes.

**Chemical Nature of Water.**— Water contains, reckoning the elements of which it is composed in volumes, two volumes of hydrogen, and one volume of oxygen. These two gases, the unlearned reader



will please remember, are highly subtle bodies, *not visible to the eye*; and yet, when chemically united, they form a liquid which covers two-thirds the entire surface of the globe, — floating upon its bosom the navies and merchant ships of all nations, and by its unmeasured depths and vast breadths and sublime movements, fills the thoughtful mind with conceptions of creative Power, which words never attempt to express. Should the two gases which compose this vast body of water cease to love each other, and fall asunder, the first lighted taper would set the world on fire, and not a living being upon its surface could escape destruction.

**Impurities in Water.**—It is not surprising that a fluid with as great a solvent power as water, should often dissolve and hold in solution a great many impurities. In passing along through the earth, before it comes up in springs and wells, it is filtered through various mineral earths, and becomes contaminated accordingly. In running through beds of limestone, it takes up a little carbonate of lime. Salt-beds impart to it common salt (muriate of soda), while sulphur and other ores tinge it with salts of various kinds.

**Water-Supply.**—At the present time all large cities and most of the towns in this country are supplied with water for domestic purposes, either from ponds or lakes, or from artesian wells, of greater or less purity, but in almost all cases superior to the common well-water, so liable to contamination by cesspools and sewage. The result is that the health of the people has been materially improved, and fevers, particularly those of a typhoid type, have diminished both in prevalence and fatality. The decaying vegetable and animal matter, which formerly was washed into the soil, and percolated into and poisoned the wells, is now washed away by copious supplies of pure, fresh water.

**Lead Pipes.**—In cities, water is usually conveyed through the dwellings in leaden pipes, — a practice fraught with a danger, to avoid which various expedients have been devised. That lead does often become oxidized and impart its poisonous properties to water when long in contact with it, is a well-known fact. Let a number of persons drink every morning from the the first water drawn from the pipes, and a portion of them will be attacked with some form of lead disease. The pipes should be emptied every morning before using the water for domestic purposes, and then there is little danger. Tin-lined pipes have been found to be almost entirely free from danger of lead-poisoning.

**Physical and Other Properties of Water.**—Good water is without smell, is perfectly clear, and in the mouth has a soft and lively feel. When poured from one vessel to another, it should give out air-bubbles. Boiled and distilled waters have a vapid, flat taste. This is owing to their containing no carbonic acid gas or atmospheric

air,— these being driven off in the act of boiling and distilling. A hundred cubic inches of good river water contain about  $2\frac{1}{4}$  of carbonic acid, and  $1\frac{1}{4}$  of common air.

Carbonic acid is what gives to mineral, or soda water, its brisk, and even pungent taste. Without a portion of this acid and atmospheric air, water is perfectly insipid, and not fit to be used as a beverage. Hence, if it be boiled or distilled to clear it of earthy matters, we must expose a large surface of it to the air, and shake it, that it may re-absorb from the atmosphere what it has lost, and thus recover its taste.

**Rain Water is the Result of Distillation** on a large scale, and would be insipid, like other distilled water, only that, after being distilled off from the waters upon the surface of the earth, it recovers, while ascending as vapor, the carbonic acid and atmospheric air.

Fishes breathe air as well as land-animals, and hence, lakes upon the tops of high mountains, where but little oxygen can be absorbed into the water from the air, are not inhabited by the finny tribes.

**The Saltness of the Ocean** is simply the accumulation of the saline substances washed out of the bowels of the earth.

The water which for thousands of years has been distilling off as vapor from the surface of the ocean is nearly pure. Being carried by the winds to the continents, it falls as rain, sinks into the earth, is filtered through mineral substances, comes to the surfaces in springs, is collected into rivers, and, with all its freight of mineral salts, is borne back to the ocean. Everything that water can dissolve, and carry down from the continents, finds a great depository in the ocean; and as this has no outlet, the accumulation must go on without limit. Rivers which flow into the ocean contain from ten to fifty grains of salts to the gallon,—composed chiefly of common salt, sulphate and carbonate of lime, magnesia, soda, potash and iron; and these are the constituents of sea-water.

**Cleansing of Impure Water.**—Impure waters should be cleansed before being used for domestic purposes. Distillation is the most perfect method of purification. Filtration through sand is a good method. It removes all suspended vegetable or animal matter, and all living animals. Boiling likewise kills all animals, and throws to the bottom carbonate of lime. It is this which constitutes the crust which lines tea-kettles in all regions where limestone exists.

Settlers in a new country should make it a prime object to find good water. This is of great moment. Their own health and the health of their posterity is dependent upon it. Any soil, good or bad, is not worth half price, if it yield impure water.

**Reasons for Prizing Water.**—Finally, we ought all to prize water very highly, for it *composes nearly eight-tenths of our entire bodies*, including our flesh, blood, and other fluids. Nay, we owe to it the very



softness, delicacy, and smoothness of our persons. Our muscles, nerves, blood-vessels, glands, cartilages, etc., all play smoothly upon each other in consequence of water. Take all the water out of us, and we should be dry sticks indeed. All our comeliness would be gone. Nobody would or could love us. We should be walking reeds, shaken and sported with by every wind. Let us never forget how much we are indebted to water.

### Exercise.

ANIMAL life is conditioned upon exercise. Without it health cannot exist, or life itself be continued for any great length of time.

Proper exercise communicates motion to every part susceptible of it. It expands the chest, contracts and relaxes the muscles, quickens the motion of the blood, moves afresh all the other fluids, and stirs to the centre of the whole frame. More easy and perfect digestion, the nutrition of every part, and the proper performance of all the secretions and excretions, are the results of such exercise.

A distinguished physician said: "I know not which is most necessary to the support of the human frame, food or motion." Some of the finest talents in the world are probably lost for the want of exercise; for without it the mind loses its keen perception and its bounding energy, its power of application and its general scope. If men of great talents would give attention to exercise, the world would reap a larger harvest from their written thoughts.

The arrangements of modern society have very much abridged the facilities for taking exercise; but if Trenck in his damp prison, with fetters of seventy pounds weight upon him, could preserve his health by leaping about like a lion, most persons could do as much with the fetters of modern *society* upon their limbs.

**Must be Regular.**—Exercise, to be of much service, must be regular, — not taken by fits and starts, — a good deal to-day and none to-morrow; but in reasonable measure every day. Occasional efforts, with intervening inactivity, only does mischief.

**Must be Pleasurable.**—It should be connected, too, if possible, with some pleasing occupation or pursuit. The movement of the limbs should carry us towards some place or end in which the mind feels an interest; exercise will then do us most good. Hence botanical pursuits, the cultivation of a garden, and the like, are often preferable to a solitary and aimless walk.

**Must not be Excessive.**—Exercise should never be carried so far as to produce great fatigue. Extremes are injurious; and too much exercise, especially by a sick or feeble person, may be as injurious as too little.

No clothing should be thrown off after exercise, nor should one cool off by sitting in a draft of air. Very serious consequences often follow this practice.

**Not to be Taken After Meals.**—It is not best to take exercise immediately after meals. The reasons for this caution have been explained. It is true many laboring men go at once to their work after eating, without apparent injury. Yet they are strong, and can endure what those who use their brains chiefly could not. And even they do not labor as easily and cheerfully immediately after dinner.

**Active and Passive.**—Exercise is properly divided into active and passive. Walking, running, leaping, dancing, gardening, various sports, etc., are active. While sailing, swinging, and riding in carriages are passive. Riding on horse-back is of a mixed nature,—being both active and passive.

A few remarks upon these several kinds of exercise will have a practical value to some of the readers of these pages.

**Walking** is one of the most gentle, easy, and generally one of the most useful of the active exercises. It is within the reach of all who have the use of their limbs, and is indulged at the expense only of a little shoe-leather. To make it agreeable, the face is only to be turned to some favorite locality, and the mind put in communion with the voices of nature.

To walk with the best advantage, the body should be kept upright, the shoulders thrown back, the breast projected a little forward, so as to give the lungs full play, and the air an opportunity to descend to the bottom of them. This attitude places all the organs of the body in the most natural position, and relieves them from all restraint. Walking then becomes a source of pleasure. The artist who bends over his pallet, and gets into a cramped position, is by this kind of walking relieved, and his body kept upright. Females, particularly of the wealthier class, are much more apt to neglect this species of exercise than males.

It is not so in England. There it is no uncommon thing for ladies of high rank to walk ten miles a day; and they do it in shoes of sufficient thickness to protect their feet from all dampness, and in clothes large enough to give their muscles full play. As a consequence, they enjoy excellent health, and in many cases even retain their freshness and beauty to old age.

A master of one of the vessels of our navy who spent some time, lately, in the British Channel, was several times invited to spend the evening at Lord Hardwick's, where he made the acquaintance of two daughters of his lordship, who, in the drawing-room, he thought the most accomplished ladies he ever saw. Yet those young women, on two occasions, in company with other friends, walked miles to visit his vessel, once on a rainy day, clad in thick, coarse cloth cloaks which no rain could penetrate, and caring as little for wet weather as a couple of ducks.

**Good for the Studious.**—For the studious, walking is a most capital exercise. It varies the scenes so constantly, and brings the mind



in contact with so many objects, that the monotony of in-door life is admirably broken. It was a maxim of Plato, that "he is truly a cripple, who, cultivating his mind alone, suffers his body to languish."

**Good in Cold Weather.**—Walking is valuable in cold weather, because it exposes one to the cold atmosphere, and hardens the person against frosty weather,—a consideration of great consequence in countries which are subject to extremes of cold.

**Running and Leaping** are forms of exercise which should be indulged with prudence even by the young and healthy. For the feeble and the aged, they are entirely inadmissible. Used cautiously, in a system of regular training, they may help raise the bodily powers to a high degree of agility and endurance. The North American Indian, who was bred to the chase, ran with surprising swiftness, and for endurance was scarcely excelled by his faithful dog. What training has done for the Indian, it may do for the white man, who may chance to inherit as good a constitution.

**The Game of Base-Ball** requires very active running, and for the young, it is an exceedingly healthful amusement. It fills the whole frame with a bounding spirit, and sets the currents of life running like swollen brooks after heavy rains.

**Gymnastics.**—The more active species of exercise have generally been included under the term gymnastics. Among the Greeks and Romans, feats of strength and endurance were supposed to confer honor. For this reason, and because war was a laborious calling, requiring bodily endurance and strength, their youth were trained in the most active exercises. Gymnastic games were with them at once the school of health and the military academy.

In England, during the middle ages, acts of Parliament and royal proclamations were employed to regulate and foster those manly sports and exercises, which fitted the people for the activity required on the field of battle.

Those preparations for brutal wars would be unsuited to the present state of the world; but the capacity for endurance which these trainings produced, could be most usefully employed in the laborious and scientific researches which modern advancement requires. Very few of our scientific men have sufficient hardness of frame to sustain them in their laborious studies.

The heart-diseases which prevail so extensively are the result, many of them, of violent exercise, taken, perhaps, from necessity, and proving injurious because not a matter of every-day practice. Violent exercise, more than any other kind, must be regular in order to be borne.

**Needed by Young Women.**—Gymnastic exercises and calisthenics are particularly needed by our young women, to give them something of the robustness of our mothers, a few generations back. For the

want of them, they are dwindling away, and becoming almost worthless for all the purposes for which they were made.

In view of this want of exercise the introduction of the bicycle offers an excellent means of development for ladies, and it is very gratifying to note its increasing use. It brings into play many of the muscles of the body, while affording an exhilarating enjoyment of fresh air and changing scenery. But caution must be used, not to overdo one's self. Short rides only should be taken at first, increasing the distance as the muscles become hardened.

**Moderns Physically Inferior to the Ancients. Reason for it.—**

It is evident that the moderns are inferior in bodily strength to the ancient Greeks and Romans. Before the introduction of Christianity, men knew very little about the future, and therefore strove to make the most of the present. Hence, they took measures to ensure health and long life. It is true that a due regard to the welfare of the future need not, and should not, prevent a care for the present; but from various causes, to be referred to on a subsequent page, such has been the practice, to the manifest physical injury of the race.

**Dancing**, when hedged about with proper restrictions and limitations, has great advantages as a physical training for the young. There are very few forms of exercise which give so free a play to all the muscles, and at the same time so agreeably interest the mind. Begun in early life, and pursued systematically, dancing imparts a grace and ease of motion which nothing else can give. For this reason alone, it should be cultivated as an art.

Every man and woman is often placed in circumstances in life where the possession of an easy carriage of body, and an unembarrassed manner, would be prized above gold. One's personal influence in the world is greatly increased by an easy, graceful manner. We all know how a polite manner wins, while a rough and uncouth one repels us.

**Warning against Excess.**—While dancing has many things to recommend it, there are also several considerations which should warn us against using it to excess, particularly in the ball-rooms of fashionable life. So many muscles are called into play, the breathing is so much quickened, and the air breathed is often so impure, that the circulation of the blood is hastened almost to fever excitement. And when to this we add the use of wines and cordials, alternated with ices and iced drinks, and the exposure, on returning home from balls, to the chilly night air, under the insufficient protection of light clothing, we have drawbacks enough to abridge, if not to annihilate the benefits derived from this otherwise healthful and elegant exercise.

But then it will be said, and truly enough, that these are the abuses, not the uses of dancing. To these abuses, no parent should permit the health of a child to be exposed. In the parlor at home, with a few young friends gathered in to spend an evening; or, in a well-venti-



lated hall, under the instruction of a master of known character and refinement, dancing is of high utility, and much may be said in its favor. An amusement for which there is so general a fondness, one may say, passion, must be fitted to meet some want of the animal economy, and perhaps of man's higher nature.

Grace of motion gratifies our sense of the beautiful, and in its nature is allied to poetry. Turning away from the abuses of dancing, let the reader thankfully use it as one of the very best physical, social, and æsthetical educators of youth.

But if dancing is salutary, it is only when every limb and muscle is allowed to participate naturally and without restraint in the general motion. When performed in a dress so tight as to restrain all freedom, not only is every grace destroyed, but injury of a serious character may be the result.

**The Cultivation of a Garden** is also a species of exercise highly conducive to health. To the poor it should have a double attraction. It is not only a healthful exercise, but it yields, in its season, many wholesome vegetables, the price of which, when they have to be purchased, frequently puts them beyond their reach. It is pleasant to know that in many of our manufacturing towns the workmen own small pieces of ground which they cultivate as gardens,—deriving health both from the labor, and from the vegetables raised. This is one of the kinds of exercise which are more beneficial from having an end in view. The man who works in his garden derives pleasure from the improvement he is making upon his ground, and from the prospect of advantage to himself and family.

**Other Active Exercises.**—To the exercises already spoken of may be added those which are mostly taken indoors,—the dumb-bells, jumping the rope, battledore, etc. They may be resorted to when the weather is stormy, or when any other cause may prevent one from going into the open air. Nevertheless, as promoters of health, they are inferior to those exercises which take one out under the open sky. They are too mechanical in their nature, and have too little aim, to be allowed to take the place of the preceding.

### Passive Exercises.

**Sailing.**—This, to many persons, is among the most pleasurable and exciting of the passive exercises. But the excitement arising from the motions of a boat, sometimes, in case of timid persons, degenerates into *fear*, which is injurious. Young gentlemen who manage the boat upon sailing excursions, should never put on too much sail in a brisk wind, and torment the ladies by exciting their fears, as their own amusement may be in this way purchased at the cost of others' health,—a result far enough from their thoughts or intentions, but not the less real.

**Swinging.**— The sick may sometimes indulge in this exercise, when capable of enduring no other. To swing gently has a soothing effect, and often allays nervous irritability in a way which nothing else can. It is like the lullaby motion of the cradle. It calms and soothes. .

Nervous children and grown persons in feeble health are sometimes, by roguish boys, swung too high, and very much excited and alarmed. This is wrong. It may do great injury. Very few boys would do it if they knew the evil consequences. Boys and girls are generally kind-hearted; and though they may like to hector others, they will seldom knowingly *injure* them for their own amusement.

**Carriage-Riding.**— The advantages to be derived from this species of exercise are probably rated too high. For feeble persons, just recovering from illness, who cannot endure walking or riding on horse back, it is valuable, particularly if taken in an open carriage. But for those who have more strength, it is less desirable than many other exercises. True, it is generally an *agreeable* mode of locomotion, and for this reason, it is more serviceable than the small amount of exercise afforded by it would lead one to suppose.

Carriages are luxuries, and like all other luxuries, they are apt to bring on debility, and perhaps shorten life. A man is apt to order his carriage to the door at the time when increasing wealth enables him to retire from the active pursuits of life,—the very moment when he is most in need of some exertion to take the place of that to which he has been accustomed. Yet so it is, luxury comes to enfeeble, at the time when we need something to harden us.

Could rich men be persuaded to let their luxuries consist, in part, in doing good, and, like Howard, find pleasure in travelling on foot to visit those who are sick and in prison, they would be surprised to see how their happiness would be increased.

Close carriages are generally used by the wealthy. They at best contain but little air, which is breathed over and over, and becomes unfit for respiration. The windows of such carriages should always be open, except in rainy weather, when the latticed windows only should be used.

**Riding in Sleighs** furnishes an agreeable excitement, and may be indulged in to some extent with advantage. Yet it can be had only in cold weather, and persons who partake of its pleasures should be careful to wear clothing enough to protect themselves against the frost. This is the more necessary, as very little motion is communicated to their bodies by the sleigh.

**Horseback Riding.**— This form of exercise may fairly rank next to walking; in some states of the system it is preferable. It justly holds a high rank as an exercise for *consumptive persons*. Many a man, and woman too, has been benefited by it when suffering from lung disease. For those who have *hernia*, or falling of the bowel, it is not proper, as the most serious consequences may result from its use.



**The Horse should be Owned.**—A feeble man who rides on horse-back, should, if possible, own his horse; for, becoming attached to him, as he generally does, he will be able to ride farther than upon an animal in which he feels less interest. A horse is a noble creature, and a man who loves him will sometimes acquire a passion, almost, for being upon his back, and witnessing his splendid performances.

**Pleasurable Exercises most Beneficial.**—Finally, those exercises are most beneficial, and can be longest endured, in which we feel the greatest interest. Place before even a feeble man some desirable object, and he will endure a great deal to reach it; or engage the mind of a very tired person in something which greatly interests it, and considerably more exertion will be easily borne. This is well illustrated by the story told by Miss Edgeworth of a certain father, who had taken a long walk with his little son, and found the boy apparently unable to walk further, some time before reaching home. "Here," said the shrewd-minded father, "ride on my gold-headed cane." Immediately the little fellow was astride the cane, which carried him as safely home as the freshest horse.

**Mental Co-operation** is of the highest importance in all exercise. Men who are paid by the job, work with far more spirit than those who are paid by the day. One would dig in the earth with very little spirit, if he had no motive for doing it; but if expected with every shovelful of earth to bring up gold-dust, he would not only work with a will, but would endure a great deal more labor. From these considerations we may infer that those farmers and manufacturers who pay their men the highest wages, make the most money on their work.

**The best time for taking exercise** is that in which it does us most good. For most persons the morning hours may be considered most favorable. But there are many who cannot take exercise in the early morning, without suffering from it through the whole day. Some are able to walk miles in the afternoon, who would be made sick by similar exertions immediately after rising.

Persons often injure friends who have this peculiarity of constitution by urging them out in the morning. They do it from good motives, but are, nevertheless, blameworthy for attempting to advise in matters which they do not understand.

## Rest and Sleep.

OUR bodies are like clocks; they run down and are wound up once every twenty-four hours. Were they obliged to work on uninterruptedly, they would wear out in a few days. It is a merciful provision that periods of repose are allotted to us. Everything has its

proper place. Rest is not less a luxury after exercise, than exercise is after rest. They both confer happiness at the same time that they promote our well-being.

**Sleeping Rooms.**—The largest part of our rest is taken in sleep. Of course the kind of room in which we sleep is worthy of consideration. Hufeland says: "It must not be forgotten that we spend a considerable portion of our lives in the bed-chamber, and consequently that its healthiness or unhealthiness cannot fail to have a very important influence upon our physical well-being." It should at least be large. That is of prime importance, because, during the several hours that we are in bed, we need to breathe a great deal of air, and our health is injured when we are obliged to breathe it several times over. We should at least pay as much attention to the size, situation, temperature, and cleanliness of the room we occupy during the hours of repose, as to the parlors, or drawing-room, or any other apartment. And yet how different from this is the general practice of families. The smallest room in the house is commonly set apart for the bed and its nightly occupants.

The sleeping-room should have a good location, so as to be dry. It should be kept clean, and neither be too hot nor too cold. And, more important still, it should be well ventilated.

One bed, occupied by two persons, is as much as should ever be allowed in a single room; though, of course, two beds in a large room are no more than one in a small one. Both are objectionable.

**Fire in Sleeping Rooms.**—As to having fire in a sleeping room, that is a matter to be determined by the health of the occupant. Persons who have poor circulation, and are feeble, had better have a little fire in the bed-chamber in cold weather. For those in good health a cold room is preferable.

**Open Windows in Sleeping Rooms.**—In the hot weather of summer, it is better to keep the windows open to some extent, through the night, but not on opposite sides of the room so as to make a draft across the bed.

There is a difference of opinion as to the safety of this practice, but the experience of those who have used it prudently and perseveringly has generally sanctioned its employment. It is presumed that night-air is made to be breathed; and if we breathe it habitually, there is no good reason why it should be considered hurtful. At all events we have got to do one of three things,—either breathe it, or be poisoned by air which is breathed several times over, or use very large sleeping rooms, and then lay in a stock to last over night.

**An Open Fireplace** in a bed-chamber will do much towards its purification. It carries off foul air. But many persons board up this outlet as if bad air were a friend with whom they could not think of parting. At the same time they will carefully close all windows and doors, as if fresh air were an enemy not to be let in.



**Beds.**— It is a pleasant thought that while so many things which injure health are coming into fashion, some which have a like effect are going out. Among the injurious things which are silently withdrawing are feather-beds.

In earlier times, a bed made of eider-down was thought to be a great luxury, to be carefully preserved, and handed down from mother to daughter. Beds made of hen's feathers, and other coarser kinds, were thought to be only fit for children. With due deference to these earlier judgments, it must be said that feather beds, whether downy or coarse, are not even fit for children. They are composed of animal matter, and by a slow process of decay, are always, when stirred, sending up an exhalation which it is not healthful to breathe.

By their softness, too, they increase the general tendency to effeminacy. In warm weather they are too heating. To sink down into them, and lie nearly buried all night, is to insure a feeling of lassitude and debility in the morning. Only the strongest persons can endure it without being made conscious of the evil effects.

**Beds must not be too Hard.**— On the other hand, it is almost equally unwise to choose a bed of absolutely unyielding hardness. When very tired, we may rest even upon a board; but sleep will generally be more sound as well as refreshing, if the bed be somewhat yielding. The hair mattress is the very best bed yet used. It is healthful and easy. No person once accustomed to it will ever return to feathers. In summer, it is a luxury; in winter, it is sufficiently warm, though a little more covering is needed than with feathers. \*

**Bedding.**— In hot weather, linen sheets are preferable to cotton, and of course will be used by those who have ample means. But cotton ones are good enough, and in winter are decidedly the more desirable of the two. Cotton is best, too, for those who suffer with rheumatic affections. For external covering, comforts are objectionable, because they do not let the insensible perspiration pass off as freely as it should. They are light, however, and so are rose blankets, which have the additional good quality of being porous. We should sleep under as few clothes as possible, consistently with comfort.

**Night-Dress.**— The flannel, cotton, linen, or silk, worn next the skin through the day, should always be replaced, on retiring, by a suitable night-dress. The undershirt should be of the same material with that which is taken off, but thinner. If we wear flannel through the day, we need it quite as much at night.

**Do not Cover the Face.**— The practice of sleeping with the face entirely covered with the bed-clothes is very injurious. It compels one to breathe the air over several times.

**Natural Position for Sleep.**— The most natural position in which to sleep is upon the right side. This affords the easiest play to the

internal organs. It is best, however, to learn to sleep in different positions, and to change occasionally from side to side. Upon the back is not so easy a position. To lie in this way obstructs the circulation of the blood, by the pressure of the stomach, bowels, etc., upon the large blood-vessels which pass down and up in front of the backbone. *It is very tiresome and injurious to lie with the hands above the head.*

**Amount of Sleep.** — The average amount of sleep required by persons in health is from seven to eight hours. Occasionally we find persons who get along very well with six, or even five hours; while some, even in health, require nine. There is no absolute standard for all persons, in the amount of sleep, any more than in that of food. It depends on the temperament, the constitution, the amount of exercise, and the exhausting nature of the mental application.

The object of sleep is to repair the energies, the extent to which they are wasted, and the recuperative power possessed, will measure the amount required.

**Late Suppers.** — These are a bar to all sound and healthful sleep. The last meal should always be taken at least three hours before retiring and should be light. During sleep the stomach should have a chance to rest. It will work the better on the morrow. Some persons boast that they can sleep perfectly well after a heavy supper. Perhaps they can, but, as Franklin has wisely suggested, they may by and by “have a fit of apoplexy, and sleep till doomsday.” This will be sleeping *too well!*

**Preparation for Sleep.** — Dr. Franklin left behind the record of a wise life, as well as many excellent moral and philosophical directions. A good conscience was his prescription for quiet sleep and pleasant dreams, — a most excellent direction. Sleep is promoted, too, by withdrawing the mind, a short time before retiring, from all hard study and exciting themes of conversation, and turning it to calmer subjects of reflection, such as the moral attributes of God, and particularly his love and paternal character

## Objects of Clothing.

THE clothes we wear are intended, or should be intended, to secure three objects, — *warmth in winter, coolness in summer, and health at all times.*

It has already been shown that our bodies are warmed by their own internal fires. In the lungs, in the skin, and indeed in all parts of the body, oxygen unites with carbon and other combustible matters, producing heat in the same way that it is produced in a grate where coal is burned; and as our temperature always needs to be kept to about 98° Fahrenheit, it follows that this combustion must always be going on.



Now, the atmosphere which surrounds us is always receiving into itself the heat which comes to the surface of our bodies, and thus robbing us of our warmth. In summer, the atmosphere, full of the rays of a burning sun, may impart heat, instead of taking it away; while in winter it takes more than it gives, and would cause us to perish with the cold, were it not for the protection afforded by our clothing.

Clothes, of course, have no power to manufacture or impart heat. They only retain, and keep in contact with our bodies, that which is generated within us. If we have on a single garment which is made tight at the bottom and top, so that no current can pass up or down, there will be a layer of air between it and the body, which, becoming immediately heated, and being retained there, helps keep us warm, or rather, prevents us from being cold. With every additional garment put over this, there is another layer of heated air, adding still more impenetrable guards against either the intrusion of cold, or the escape of internal heat.

**Bad Conductors of Heat.**— But, that our clothes may thus retain our warmth, and prevent its dispersion, they must be *bad conductors of heat*,— that is, they must not readily take up the heat and convey it away from the body. They must slowly absorb the caloric into their own substance, and then retain it tenaciously.

**Linen**, which is so universally popular in temperate climates, as an article to be worn next the skin, is unfortunately a good conductor of heat. It does not afford a warm garment. It conducts heat rapidly away from the body. Hence it always feels cool to the touch. It is really no colder in itself than other kinds of cloth, but it is solely the rapidity with which it conducts heat away from the body, that gives it the feeling of coldness. It has other qualities which compensate, in some measure, for this defect. The fibres of which it is composed are round and pliable, which makes linen cloth smooth and soft, and the sensations produced by it on the skin altogether agreeable. Fig. 67 represents a fibre of linen, as it appears under a microscope which magnifies it 155 times.

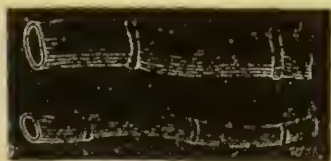


FIG. 67.

**Cotton** is warmer than linen, because it is a *worse conductor* of heat. The perfection to which its manufacture has been carried, makes it almost a rival of linen in softness and pliability. It does not absorb as much moisture as linen, and therefore better retains its powers as a non-conductor. But then the fibres of cotton are not round and smooth, like those of linen, but flat and spiral, with sharp edges. Fig. 68 represents two of its fibres, magnified 155 times. This renders cotton irritable to some very delicate skins. This is the reason why linen

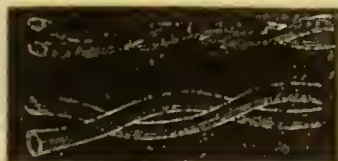


FIG. 68.

is better than cotton for binding up wounds, where there is tenderness of the surface.

**Silk** has a round fibre, like linen, which is even softer and smaller. It absorbs less moisture than cotton, and in its power of retaining warmth, it is superior to both the preceding. It forms the most desirable fabric for clothing that we have; but its cost makes it inaccessible to the great body of the people, except as a holiday dress for the ladies. Its culture in our country, if extensively established, would be a source of national wealth.

**The Fibre of Wool** is quite rough, almost scaly, and highly irritative to delicate skins. Fig. 69 shows fibres magnified 310 times. It is not possible for some persons to wear it next the skin. But where this cannot be done it may be worn outside the linen or cotton; and being a good *non-conductor*, it will in this way preserve the warmth of the body, without either irritating the skin, or disturbing its electricity.

Wool, in cold climates, is one of the very best materials of which clothes can be made. In New England, and, indeed, in all cold and temperate regions, it should be worn by delicate persons, in the form of thick or thin garments, all the year round. It does not readily absorb moisture, and is a dry, warm, and wholesome material for clothing.



FIG. 69.

**Hair.**— Though not precisely in the line of these remarks, *hair* may as well be introduced here. Wool is in fact hair. Every part of the skin, with the exception of that upon the soles of the feet, and the palms of the hands, is intended to produce hairs. On most parts of the body, they are short and fine, hardly rising above the surface. Upon the head and the face, they grow to considerable length.

Hair, like wool, is a bad conductor of heat; and, as growing upon the head and face, is doubtless intended for some useful purpose. That it was designed as a warm covering, can hardly be doubted. The beard, when permitted to grow, is a natural respirator, guarding the lungs against cold and dust. It has been noticed that blacksmiths who have allowed their beards to grow, had their mustache discolored by iron-dust, which lodged among the hairs, and very justly inferred that the dust must have found its way into the lungs, and done mischief, had it not been arrested by this natural respirator.

That the beard, when long, does ward off a great many colds and throat troubles, is too well known to be denied. It has required moral courage on the part of those who have broken away from the universal practice of shaving, for which they should be honored rather than ridiculed. For those who do not suffer from throat or lung complaints, especially if they are getting advanced in life, it may not be thought worth while to abandon the razor. Yet the change would



FIG. 70.



not be regretted. Fig. 70 is a human hair, magnified 250 times, showing its scaly surface.

**The Color of our Clothing** is a matter of some moment. The dark colors absorb the light, the sun's rays, and heat, much more than the lighter ones; and as those bodies which absorb heat well are likewise good radiators, the *dark colors have the highest radiating power*. White reflects heat and rays of light, and is a bad absorber and bad radiator. In summer it prevents the sun's rays from passing inward to heat the body, and in winter, interrupts the heat of the body in its passage out. In summer, it makes the coolest garment; in winter the warmest one. These facts can be very simply illustrated, by laying, side by side, upon the snow, when the sun shines, two pieces of cloth, the one black, the other white. Lifting them up, after a time, the snow will be found considerably *melted under the black cloth, but not under the white*.

It is now seen that the object of clothing is not to impart heat to the body, but to prevent its loss; that it is not to create it, but to furnish the occasion for increasing its degree. It appears further, that clothing protects the body against the evil effects of changes of temperature, and that white garments, by reflecting, instead of absorbing heat, guard it against the heat of summer.

**Clothing should be Porous.**—All articles used for garments should be *porous*, and permit the free passage of insensible perspiration. The skin receives oxygen through its pores, and gives back carbonic acid. It performs a sort of subordinate respiration. India-rubber garments, worn next to it, interrupt this, and must do mischief. Shoes made of this material soon cause the feet to become damp and cold. The dampness is occasioned by the insensible perspiration, which cannot escape through the rubber. Such shoes worn in the open air, should be immediately taken off on entering the house.

**Thin Shoes.**—The defective way in which American females protect their feet from cold and wet, is a sore evil; and he who persuades them to adopt a wiser fashion, and cover their feet with better guards against colds and consumption, will deserve the gratitude of the nation. We are in many things too fond of copying foreign fashions: but if our ladies would, in this matter, follow the excellent example of English women, they would live longer, and leave a hardier posterity behind them.

The shoes worn by our females, high and low, rich and poor, are not thick enough to walk with safety upon a painted floor, hardly upon a carpet in an unwarmed room; and yet they walk with them upon cold brick sidewalks, upon damp and frozen ground, and even in *mud*.

The result is, that they suffer from colds, sore throats, pleurisies, lung-fevers, suppressions, inflammations of the womb, and many other ailments, which in early life rob them of their freshness and beauty.

of their health and comfort, of their usefulness to their household and the world, and leave them helpless in the arms of their friends, with a patrimony of suffering for themselves while they live and a legacy of disease to hand down to their children. Would that they were wise in season! Some, to their honor be it said, have already adopted a safer course. It is hoped the evil will be gradually corrected.

**Never attempt to mould the Form by Dress.**—Parents commit a great error when they attempt to mould the forms of their children, particularly their daughters, by their dress. This cannot be done. It is the work of nature, and she wants no assistance in it. The great object of dress in childhood, as well as in adult life, is to promote health. *With this*, there is not much difficulty in preserving the symmetry; *without it*, deformity is almost a matter of course.

The fact cannot be too often repeated, nor too seriously urged upon parents, that while the foundation of all graceful and just proportion of the different parts of the body must be laid in infancy, it cannot be done by tight bands, and ligatures upon the chest, and loins, and legs, and arms. Upon all these points, the garments of children should set easy, leaving the muscles at liberty to assume the fine swell and development which nothing short of unconstrained exercise can give. Could infants tell all the horrors they suffer from the restraints put upon them by tight dresses, it would make many a mother's heart bleed.

In these brief remarks, the principles are given which should guide us in the selection of our clothing. The intelligent reader will be able very easily to fill up the outline.

### Bathing and Cleanliness.

ARISTOTLE calls cleanliness one of the half virtues; and Addison, in the *Spectator*, recommends it as a mark of politeness, and as analogous to purity of mind. Both in the Jewish and Mohammedan law, it is enforced as a part of religious duty. Its requirement as a prerequisite to christian communion would be wiser than the demands sometimes made. A dirty Christian may perhaps be found, but not among those who mean to be intelligent.

The importance of keeping the skin clean is not generally appreciated. The motive for cleanliness is often a lower and meaner one than should be allowed to have place in the mind. Many persons would be mortified to have their hands, or face, or neck dirty, who do not wash their whole body once a year. That they may appear well in the eyes of others, is the only motive with such for keeping clean.

**Offices of the Skin.**—If we look a little at the offices of the skin, we shall better understand the need of keeping it clean.



The skin is not merely a covering to protect us from the weather. It is a living structure, curiously wrought, with a large extent of surface, and having important duties to perform in the animal economy. Its *structure* is more particularly explained under the head of "Anatomy" and "Skin Diseases." It has been already said, that it helps the lungs in breathing. It does many other things on which the health is dependent.

**Number of Perspiratory Tubes.**—The skin performs several kinds of secretion,—that is, it separates several things from the blood,—one of which is the perspiration, or sweat. The sweat is formed in small glands, situated just under the skin, and is brought to the surface in small ducts, or tubes, like the hose through which firemen throw water. These little tubes are spiral, as seen in cut 44, and run up through the two skins.

These spiral canals are very numerous, covering every part of the human frame,—there being about 2800 of them upon every square inch throughout the body; and as a man of ordinary size has about 2500 square inches of surface, the number of tubes in the skin of one man is *seven millions*.

The mouths of these tubes are called the *pores of the skin*. Each one of these tubes is extended just below the skin; and there, among the cells where the fat is deposited it, or rather the two branches into which it is divided, is wound into a coil, called the sudoriferous or sweat gland. These ducts are each about a quarter of an inch in length, which make an aggregate length of tubing in the human skin of about twenty-eight miles.

**Insensible Perspiration.**—Through each of these seven million of quarter-inch hose, there is poured out, day and night, as long as a man lives, a stream of sweat in the form of vapor. When this is thrown off very rapidly, as happens when active exercise is taken, it accumulates in drops, and is called sweat. Ordinarily it does not thus accumulate; it is then called insensible perspiration,—not being recognized by the senses.

This transpiration may be proved very beautifully by inserting the naked arm into a long glass jar, and closing up the space around it at the mouth so that no air can get in. The inside of the glass will soon be covered with a vapor, which will grow more and more dense until it is converted into drops. Boerhaave says: "If the piercing chill of winter could be introduced into a summer assembly, the insensible perspiration being suddenly condensed, would give to each person the appearance of a heathen deity, wrapped in his own separate cloud."

Now, this continual exudation of sweat through these millions of tubes is for a wise and necessary purpose. It is to take out of the blood and other fluids various salts, which would do mischief if allowed to remain longer, and particularly carbonic acid, which is

poisonous, — the same matters, in fact, which are thrown out by the lungs. The skin, in truth, is a kind of helper of the lungs; and a lady, by covering herself with garments which have no pores, and will neither admit air nor let off insensible perspiration, may be strangled almost as certainly as by putting a cord around her neck, and closing her windpipe. Almost twice as much fluid passes off through the skin as through the lungs.

**Keep the Pores Open.** — It is obvious from what has now been said, that the pores of the skin should be kept open to preserve health. When bathing is neglected, and the undergarments are not changed sufficiently often, the insensible perspiration accumulates and dries up upon the skin, mingling with the oily matter secreted by the oil-glands, and with the shreds of the scarf-skin, and forming a tenacious gluey matter, which closes up the pores. By this misfortune, that large quantity of worn-out matter which usually goes off with the fluid through the pores is retained to poison and embarrass the living current of blood, or seek an outlet through lungs or kidneys, which are already burdened with quite as much as they are able to do. How important, then, that these channels through which the body is purified should be kept open! that the skin should be kept healthy and in working order!

**The Bath, the Great Purifier.** — But this can only be done by daily washing. The bath is the great purifier of the human skin.

The antiquity of bathing is very great. The practice is supposed to reach back to the infancy of the race, or certainly to a very early period. The inhabitants of Middle Asia are said to have been the first to use the bath for the specific purposes of purification and health. Domestic baths are represented as having been used by Diomed and Ulysses. Andromache prepared warm water for Hector on his return from battle. Penelope banished sorrow by unguents and baths.

**The Baths of the Medes, the Persians, and the Assyrians** were much celebrated. Alexander, though familiar with the voluptuous baths of Greece and Macedon, was astonished at the magnificence of those of Darius.

**Roman Baths.** — As luxury and refinement advanced, the means of luxurious bathing were multiplied, until establishments were built by the Romans, the very remains of which excite wonder at this day. Among these are the Thermæ of Agrippa, of Nero, of Vespasian, of Titus, etc. One of the halls of the building constructed for baths by Diocletian, forms at this day the church of the Carthusians, one of the most magnificent temples in Rome.

**Number and Character.** — According to Pliny, baths were introduced into Rome about the time of Pompey; their first erection Dion attributes to Mæcenæ. Agrippa increased their number to



one hundred and seventy; and within two hundred years they were multiplied to about eight hundred. These establishments were so vast that one writer compares them to provinces. They were paved either with crystal, or mosaic, or plaster, and were adorned by sculpture and painting to the very highest degree. They added not merely to the health and luxury of the people, but contributed to their culture in the highest departments of art and taste.

**Names of Baths.** — To the apartment of their dwelling in which they washed their bodies in warm or hot water, the Romans gave the name of *balneum*, or bath; to the public establishments, that of *balnea*, or baths. The apartment which held the vessels was called *vasarium*. In this were the three immense vessels which contained the cold, warm, and hot water. There were instruments of bone, ivory, and metal, for scraping the skin, with a groove in the edge, through which the impurities of the skin might run off.

On the north front of the thermæ was a reservoir of cold water large enough for swimming, called by Pliny the younger, *baptisterium*. In the centre was a spacious vestibule, and on each side, warm, cold, and vapor baths, with apartments for cooling, dressing, and refreshments. There was the *frigidarium*, a vaulted room, a cooling room midway between the warmer and the open air; the *tepidarium*, with a temperature midway between the above and the hot bath; and the *calidarium*, or the vapor bath.

Then there was the room where the body was rubbed over with a great number of ointments and essences of the most precious kinds; and another in which it was sprinkled over with powder; and also a room which held the clothes, in which the bathers undressed and dressed at pleasure.

All these apartments were double, the two wings being appropriated to the sexes.

**Open to all.** — These baths, thus numerous and magnificent, were open to all classes of the people, and contributed largely to the general health and physical endurance for which the Romans were conspicuous.

**The Bath Neglected under the Christian System.** — When Jesus of Nazareth came into the world, he found man's nature cultivated in a most defective way. The moral element had sunk down to the lowest place, while the physical had risen to the highest, — just the reverse of the true order of things. This Divine Teacher came, not to recommend a neglect of the body, but a new cure for the imperishable part. Mankind were for the first time systematically taught to forgive injuries. Prostrate liberty and degraded woman became the wards of Christianity.

Unfortunately, under the new order of things, the lower element of man, which had been exalted and worshipped, was cast down and abused. What the Pagan had pampered, the Christian persecuted.

The body, which had been bathed, and scrubbed, and anointed, and perfumed, was thenceforward, in consequence of the improper interpretation of certain texts, scourged, and fasted, and clothed in rags. Thousands believed, and thousands do to this day, that to torment the body is to please God. Under this feeling, the public and private baths were neglected, and to this day no Christian nation has fully appreciated the necessity of cleanliness, and of sanitary measures for the maintenance of the public health. To a considerable extent, the body is still under disabilities; still the subject of persecution; and where this is not the case, it is too often regarded only as a loose outside garment, to be thrown over the traveller to the celestial city, and is expected to be well soiled with mud and dust. The teachings of the Great Master will by and by cease to be perverted, and will be applied to raise up man's body, as they have raised his mental and moral nature, and will make a well-developed and harmonious being.

In the meantime, it is the duty and the privilege of the physician to urge a return, not to the magnificence of the ancient regimen for training the body, but to its real efficiency in a simpler form.

**Cold Bathing.**—Water applied to the skin at a temperature below 75° of Fahrenheit, is called a cold bath. If applied to a person with sufficient constitutional energy to bear it, it is a decided and very powerful tonic. By this is meant that it promotes the solidity, compactness, and strength of the body.

The first effect of the application of cold water to the skin, is the sudden contraction of all its vessels, and the retreat of the blood towards the internal organs. The nervous system, feeling the shock, causes the heart to contract with more energy, and throw the blood back with new force to the surface.

This rushing of the blood back to the skin, is called a reaction; and when it occurs with some energy, it is an evidence that the system is in a condition to be much benefited by the cold bath. When this does not take place, but the skin looks shrunken, and covered with "goose flesh," and a chilliness is felt for a longer or shorter time after bathing, then the inference should be, either that the water has been used too profusely, or that the bather has too little reactionary power for this form of the bath. The latter conclusion must not be accepted until cold water has been tried with all possible guards, — such as beginning with tepid water, and gradually lowering the temperature; bathing for a time, at least, in a warm room; beginning the practice in warm weather; and applying the water at first with a sponge out of which most of it has been pressed by the hand. With some or all of these precautions, most persons may learn to use the cold bath. It is always to be followed by brisk rubbing with a coarse towel or flesh-brush.

**The Sponge Bath.**—A wet sponge is the simplest, as well as the best mode of applying water to the surface of the body. With per-



sons who are feeble, a part only of the body should be exposed at a time, — which part, having been quickly sponged and wiped dry, should be covered, and another part exposed, and treated in a like manner. In this way, all parts of the body may successively be subjected to the bracing influence of water and friction, with little risk, even to the most delicate, of an injurious shock. The only furniture required for carrying out this simple plan of bathing, is a sponge, a basin, and a towel. There is no form of bathing so universally applicable as this, or so generally conducive to health.

**The Shower Bath** requires a brief notice. The shock to the nervous system produced by it is much greater than that from sponging. Beside the sudden application of coldness, there is a concussion of the skin by the fall of the water. This form of the bath is excellent for those who are strong and full of vitality, but is fraught with some danger for the feeble and delicate. This, however, depends on the judgment with which it is used. In the form of a delicate shower, and with tepid water, the frailest body might bear its shock.

**The Warm Bath.**— A temperate bath ranges from  $75^{\circ}$  to  $85^{\circ}$ ; a tepid bath, from  $85^{\circ}$  to  $95^{\circ}$ ; a warm bath, from  $95^{\circ}$  to  $98^{\circ}$ ; a hot bath from  $98^{\circ}$  to  $105^{\circ}$ . A warm bath is of the same temperature with the surface of the body. Of course it produces no shock. To those who are past the meridian of life, and have dry skins, and begin to be emaciated, the warm bath, for half an hour, twice a week, is eminently serviceable in retarding the advances of age.

It is a mistake to suppose the warm bath is enfeebling. It has a soothing and tranquillizing effect. It renders the pulse a little slower, and the breathing more even. If the bath be above  $98^{\circ}$ , it becomes a hot one, and the pulse is quickened.

The temperature of the warm bath, as of the cold, should be made to range up and down according to the vigor of the frame, and the circulation of the individual. The aged and the infirm, whose hands and feet are habitually cold, require it to be well up towards the point of blood heat. The pulse should not be made to beat faster by it, nor should sensations of heat or fullness be induced about the temples and face.

**The Vapor Bath.**— This differs from the warm bath in being applied to the interior as well as to the exterior of the body. The warmth is inhaled into the air-tubes at the same time that it envelops the external person. The first sensation of the vapor bath is oppression, and causes some difficulty of breathing; but this passes off as soon as the perspiration begins to flow. From the steam-chamber, the bather should step into a tepid bath, and after remaining a short time in this, wipe himself thoroughly with dry towels.

**Cold Affusion** immediately after either the warm or the vapor bath, is excellent. In Russia it is common, after the vapor bath, to pour

upon the head of the bather a bucket of warm water, then one of tepid, and lastly one of cold; and to finish with giving him a good towelling. It is even said that the natives leave the steam and the hot bath, and roll themselves in the snow.

No danger need be feared from cold affusion when the skin is red and excited by the warm bath, provided the nervous frame is not in a depressed condition. If the body is chilled, and the nerves prostrated by disease or fatigue, the application of cold water to the skin may do great mischief, and should in no case be hazarded. Cold water applied to a *hot* skin cannot do harm; to a *cold* skin, it can do nothing but harm. Hence, the cold bath may be used with advantage on rising in the morning, while the body is warm. Another good time is at ten or eleven o'clock in the forenoon, when the nervous power is advancing towards its height for the day.

**Reaction Necessary.**—As a means for promoting cleanliness, the importance of the bath can hardly be overstated. For the support and improvement of health, it is equally important. But for the promotion of the latter, one prerequisite is essential,—the reaction of the skin.

Various means are resorted to, to secure this. The Hindoos secure it by a kind of shampooing, thus described by a writer: “One of the attendants on the bath extends you upon a bench, sprinkles you with warm water, and presses the whole body in an admirable manner. He cracks the joints of the fingers, and of all the extremities. He then places you upon the stomach, pinches you over the kidneys, seizes you by the shoulders, and cracks the spine by agitating all the vertebræ, strikes some powerful blows over the fleshy and muscular parts, then rubs the body with a hair-glove until he perspires,” etc. “This process,” says the writer, “continues for three-quarters of an hour, after which a man scarcely knows himself; he feels like a new being.” Sir John Sinclair speaks thus of the luxury of the process: “If life be nothing but a brief succession of our ideas, the rapidity with which they now pass over the mind would induce one to believe that in the few short minutes he has spent in the bath, he has lived a number of years.”

**The Coarse Towel**, the horsehair glove, and the flesh-brush are the appliances commonly used for stimulating the skin, and causing reaction. For tender skins, the towel is sufficiently rough. With this the bather should rub himself, unless he is weak and the exertion produces palpitation. The muscular exertion necessary for this will help the reaction.

**Restoration of the Bath desirable.**—It is greatly to be wished that the bath might be restored to something like the importance it held among ancient nations. It is a luxury, a means of health, and a source of purity both of body and of mind; for the morals of any people will rise where the use of the bath is regular and habitual.



The attempt to cure all diseases by what is called the "water-cure," has a bit of fanaticism about it, which will cure itself in time. But that water, used judiciously in the form of baths, is a potent moral and physical renovator of the race, is not to be doubted; and this should commend it to all sensible people, even though it should sometimes be abused by excess, as all good things are.

A people with clean hands, and clean bodies, and clean health, will very naturally come to like clean streets and clean cities, and finally, *clean consciences*. A fondness for cleanliness in one form, almost necessarily runs into a like fondness for it in other forms, until the purifying desire pervades the whole nature, moral as well as physical.

### Air and Ventilation.

WATER and air are fluids. Water covers two-thirds the surface of the globe, having a depth, in some places, of five miles or more. Air covers not merely the remaining third of the earth, but the water as well. It embraces the entire globe, pressing alike upon land and water, and having a depth of about *forty-five miles*. This is a sea of such magnitude, that the Atlantic or Pacific shrinks to a very small lake in the comparison.

Man has his residence, and walks about at the bottom of this ocean. He has no means of navigating it, and, therefore, never rises to its surface; but, with his natural eyes, and with telescopes, he discovers objects which lie millions and billions of miles beyond it, and even acquires much exact and useful information respecting them.

This vast ocean of air we call an *atmosphere*, from two Greek words signifying vapor, and a sphere,—it being an immense fluid-sphere, or globe.

**Pressure of the Atmosphere.**—This atmosphere presses upon man and upon every object on the surface of the earth, with a force equal to fifteen pounds to every square inch; and as a man of average size has a surface of about 2500 square inches, the air in which he lives, presses upon him with a weight of eighteen tons. This would of course crush every bone in his body, but for the fluids within him which establish an equilibrium, and leave him unoppressed.

**The Philosophy of Breathing** cannot be fully explained in the brief space allotted to this subject; it is enough to say, that, upon the attempt being made to draw in the breath, the muscles of the breast draw up the ribs, the diaphragm or midriff at the same time contracting,—the whole movement being such as to create a *vacuum* in the lungs. The air, pressing upon every part of the surface, as mentioned above, rushes in and fills the vacuum. The lungs being filled, the contraction of the muscles of the belly causes the diaphragm, which has sunk down towards a plane, to rise up into the form of an umbrella, and squeeze the air out of the lungs.

This is about all that need to be said of the method of getting the air into and out of the lungs. The whole process is under the control of that part of the nervous system called the *medulla oblongata*, or the top of the spinal cord.

**Objects of Breathing.**— There are at least three objects to be accomplished by breathing; the renewal of the blood and the taking of impurities out of it; the warming of the body; and the finishing up of the process of digestion, and the change of chyle into nutritive blood.

There is no good reason for attempting here to explain the last of these objects. To give any idea of the first two, it is necessary to furnish a very brief explanation of the circulation of the blood.

The heart is double. There are in fact two hearts, a right and a left, joined together. The right heart receives the blood from the veins, and forces it up into the lungs, whence it is brought back to the left heart, and by this is driven through the arteries into every part of the body. When received into the lungs, the blood is of a dark purple color, and is loaded with carbonic acid and some other impurities. It has also been deprived, during its circulation through the body, of most of its oxygen. The small, delicate vessels which convey this dark and impure blood through the lungs, pass directly over the air-cells; and at this moment the carbonic acid and water pass through the blood-vessels and air-cells, and are borne from the

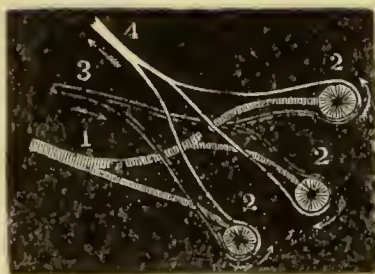


FIG. 71.

body on the outgoing breath; while the oxygen enters the blood through the walls of the same vessels; and this exchange, which takes place with every breath, alters the blood from a dark purple to a scarlet red. Fig. 71 shows at 1, a bronchial tube divided into three branches; 2, 2, 2, are air-cells; 3, branches of the pulmonary artery winding around the air-cells with the dark blood to be reddened.

That carbonic acid and water are borne out of the lungs with every breath, may be easily proved. If we breathe into lime-water, it will become white. This is owing to the carbonic acid in the breath uniting with the lime, and producing carbonate of lime. Then, if we breathe upon a piece of glass, it becomes wet, showing that there is watery vapor in the breath. That the blood receives oxygen from the air we breathe is proved by the fact that the ingoing breath has one-fourth more oxygen in it than the outgoing.

The lungs, then, take out of all the air we breathe, one-fourth of its oxygen. If we breathe it over a second, a third, and a fourth time, it not only has less oxygen each time, and is less useful for the purposes of respiration, but it becomes positively hurtful by reason of the poisonous carbonic acid which, at every outgoing breath, it carries with it from the lungs.

**Effect of Sleeping in a Small Room.**— Now, consider the effect of



sleeping in a small room, seven feet by nine, not furnished with the means of ventilation. A pair of lungs, of ordinary size, take in, at each breath, about a pint of air. Out of this air one-fourth of its oxygen is extracted; and when it is returned from the lungs, there comes along with it about eight or nine per cent of carbonic acid. As it is not safe to breathe air containing more than three or four per cent of this gas, the pint which the lungs take in and throw out at each breath is not only spoiled, but it spoils something more than another pint with which it mingles; and as the breath is drawn in and thrown out about eighteen times per minute, not less than four cubic feet of air is spoiled in that time by one pair of lungs. This is two hundred and forty feet an hour; and in eight hours, the usual time spent in the sleeping room, it amounts to one thousand nine hundred and twenty cubic feet. During the hours of sleep, therefore, one pair of lungs so *spoil* one thousand nine hundred and twenty cubic feet of air that it is positively dangerous to breathe it.

In a room seven feet by ten, and eight feet high, there are five hundred and sixty cubic feet of air, a little more than one-quarter the amount spoiled by one pair of lungs during sleeping hours. In a room of this size, there is not air enough to last one person three hours; and yet two persons often remain in such rooms eight or nine hours.

Why then do they not perish? Simply because no room is entirely air-tight. Fortunately, all our rooms are so made that some foul air will get out, and a little that is pure will find its way in. *Were it not so, no man who closed the door behind him, for the night, in a small bed-room, would ever see a return of day.*

Suppose fifty children are confined in an unventilated school-room, twenty feet by thirty, and ten feet high. These children will spoil about one hundred and fifty feet of air in one minute, or nine thousand feet per hour, or *twenty-seven thousand feet in three hours*,—a usual half-day's session. But the room holds only *six thousand cubic feet of air*,—*the whole of which these children would spoil in forty minutes.*

These simple facts show the absolute necessity of ventilation. Yet how poorly it is provided for in our sleeping rooms, our sitting rooms, our school houses, our churches, our court houses, our halls of legislation, and even in our anatomical and medical lecture-rooms!

**In sick-rooms, ventilation should receive special attention.**—Every disease is aggravated by the breathing of bad air. Yet it is common to close all the doors and windows of rooms where sick persons are confined, lest the patients should take cold. This is a bad practice. The sick should have plenty of fresh air. Their comfort is promoted by it, and their recovery hastened.

It is strange that human beings should be afraid of pure air. It is their friend and not their enemy. Impure air only should be shunned.

**The supply of good air ample.**— There is no necessity for breathing air which has lost a part of its oxygen, and acquired a portion of carbonic acid. The supply of good air is ample. An ocean of it forty-five miles deep, covering the whole globe, seems a pretty plain intimation that it is not to be sparingly used. When men retire within their dwellings, and attempt to shut out this great sea of air, they show about as much wisdom as would be exhibited by fishes which should build water-tight huts around themselves at the bottom of the ocean, and swim about continually in the unchanged water within. Fishes can only live in glass globes when the water is changed every day; and if the water be changed half a dozen times a day, they cannot be as healthy as when swimming in the great ocean.

**Cultivating Trees.**— In most of our cities there is almost a criminal neglect of the cultivation of trees; yet they add greatly to the health, and prolong the lives of the citizens.

The leaves of a tree are the lungs with which it breathes; but instead of extracting oxygen from the air, and giving back carbonic acid, like man, it takes only the poisonous carbonic acid, and gives back oxygen.

Were there no animals on the globe, the vegetables would consume all the carbonic acid, and die for want of breathing material; on the other hand, were there no trees or other vegetables, the animals would in time so far exhaust the oxygen as to perish for lack of it. The two together keep the air healthy for each.

The relation of plants and animals, in all that relates to their peculiar actions and effects, is a complete antagonism. Their movements are in contrary directions, and by hostile forces. Their opposing actions may be illustrated thus:—

THE VEGETABLE PRODUCES the non-nitrogenized substances, sugar, starch, and gum.

THE VEGETABLE DECOMPOSES carbonic acid, water, and ammoniacal salts.

THE VEGETABLE DISENGAGES oxygen.

THE VEGETABLE ABSORBS heat and electricity.

THE VEGETABLE IS A DE-OXIDIZER.

THE VEGETABLE IS STATIONARY.

THE ANIMAL CONSUMES the non-nitrogenized substances, sugar, starch, and gum.

THE ANIMAL PRODUCES carbonic acid, water, and ammoniacal salts.

THE ANIMAL ABSORBS oxygen.

THE ANIMAL PRODUCES HEAT and electricity.

THE ANIMAL IS AN OXIDIZER.

THE ANIMAL IS LOCOMOTIVE.

We learn from the facts of Geology that the time was in the history of our globe, when lunged animals could not breathe its atmosphere; it was too much loaded with carbonic acid. The trees then grew with a rapidity almost inconceivable, decomposing the poisonous gas, taking to themselves the carbon and setting the oxygen free, and lifting up their brawny arms to heaven in acts of thankfulness for the great feast.

At length the noxious gas was exhausted; and then, pale and sickly, they feebly held up their hands for help; and God sent numberless tribes of warm-blooded animals, full of life and energy, that



supported in the exhilarating air, and destroyed vast forests, thereby reproducing carbonic acid.

These simple facts should teach man the sanitary importance of trees and bushes; and wherever he has a rod, I had almost said a foot of ground to spare, a tree should be planted and carefully nursed. This is particularly necessary in large cities. Every narrow street in a city should be lined with trees. For their absence, thousands of men, women, and children have died sooner than they otherwise would. We want them stretching up their arms to all our windows to give us oxygen, and to take to themselves the carbonic acid we exhale.

**Tight Dresses.** — The health may be injured by not breathing air enough, as well as by inhaling that which is impure. It is therefore improper to compress the lungs by wearing tight dresses. If the ribs are held down by the dress, but little air can get into the lungs, and only a small amount of carbonic acid can be carried out. In this event, the health is injured in two ways: the blood is not vitalized by oxygen received, and it is poisoned by carbonic acid retained.

Tight lacing has in a measure gone out of fashion; yet too much of it for the best development of female health is yet retained. As a knowledge of physiology and the laws of life, and a better judgment of the true symmetry of the female form prevail, this barbarous custom will pass out of use, and the substantial health and real beauty of the American woman will together rise to a higher standard.

**Fill the Lungs well.** — Persons who take but little exercise are apt to acquire the habit of drawing the air very little into the lower part of the lungs. This should be counteracted by taking long and full inspirations for a short time, every day, while in the open air. This practice would get the lungs in the habit of opening to the air quite down to their base, and would make the breathing much more natural as well as effectual at all times. In the case of young persons, it would enlarge the capacity of the chest, and add to the brief years of life. Parents should see to it that their children spend from ten to twenty-five minutes every morning inflating their lungs with pure air.

## Travelling.

It is true that many persons who dwell in one spot, and hardly move from it all their lives, live to old age. Yet change of location for a short time, or permanently, does promote health, and protract life. The mind tires of contemplating one set of objects for a great length of time; and in the absence of all stimulation, it sinks into apathy, and imparts no energy to the body. The physical frame, partaking of the ennui of the mind, droops. This is doubly true when one is suffering from illness.

Travelling is eminently fitted to draw the thoughts of the nervous and feeble from themselves, and to turn them with interest to outward objects. This is of great importance. It is better than stimulants and tonics.

The nervous system has great power over the health; and the pleasurable sensations, excited by visiting new places and scenes, and conveyed to the mind through the nerves, often awaken in the constitution energies which are essential to recovery.

Travelling places a man in entirely new circumstances. It surrounds him with novelties, every one of which makes a demand upon his attention. It breaks up his old trains of thought, which have been monotonous so long that they have grown oppressive. It causes the world to touch him at a thousand new points, and surprises him every day, perhaps every hour, with a view of the false relations he has sustained to it. It opens to him new depths in his own nature, and causes him to wonder that they never attracted his attention before. It opens to him one door after another, leading him into new apartments of knowledge; and as the world grows, he finds himself growing with it, until his whole nature dilates and beats with new life.

**Means of Travelling Increased.** — The last twenty-five years have greatly increased the facilities for travelling. Many of the sick may now seek health in distant lands, who, had their circumstances been similar twenty years ago, would have been compelled to pine at home. The railroads give an easy journey to thousands with the comforts of the parlor cars.

**One thing more wanted.** — But one thing is wanted to bring the means of travelling, for the sick, very nearly to perfection; it is a method of propelling carriages upon common roads, by some cheap power, which can never be exhausted, and which shall be easily managed by the traveller or his companion. This is a prominent want of the present hour; a giant discovery, which, at a single stride, would carry the world forward a hundred years, and which, we may hope, is in the womb of the near future. The power, it is believed, will be *electro-magnetism*. The mode of applying it, when discovered, will be simple, yet wonderful; and the results to the sick, beneficent beyond expression. The human mind cannot conceive the advantages which invalids would derive from such a mode of conveyance. Journeys might be long or short; might be made with any rate of speed which the strength permitted. The morning or afternoon stages might be discontinued when fatigue demanded, and resumed at pleasure. Over uninviting regions the traveller might glide swiftly, and linger where Nature spreads her feasts for the mind.

**The best Seasons for Travelling** are spring and autumn. Winter is too cold. A pleasurable excursion may sometimes be made in summer, but in general the season is too hot for comfort. In chang-



ing climate, food, water, etc., in the sultry season, there is danger of contracting very troublesome bowel complaints.

**Means of Travelling for the Poor.** — There is one painful thought connected with travelling as a means of health,—it cannot be enjoyed by the poor. When sick they generally have the careful attention of humane physicians; they receive from kind neighbors little delicacies of food and drink; they are watched with by night, and visited by day; but though suffering from the hard routine of a laborious life, and needing diversion and recreation more than all else, they cannot travel. They have not the means, and nobody thinks of supplying them for such a purpose.

This is a channel into which charity ought to pour some of its benevolent streams. In large cities there is a class of poor females who sit in their small rooms and ply the needle diligently through the whole year, and who run down every summer very near to confinement in bed. Two or three weeks, in the hot season, spent in travelling in the mountains and elsewhere, would bring back the color to the pale cheeks of such persons, and save them many years both from the grave and from the almshouse. No millionaire could make a better use of property than to set it apart, at his death, for the specific purpose of enabling the poor to travel. And if this suggestion should induce one rich man to consecrate his wealth to the Godlike work of bestowing health, happiness, and intelligence upon the poor, the great labor of preparing this book will not have been endured in vain.

### Amusements.

THAT which engages the mind, and at the same time impresses it with pleasurable sensations, is a sufficiently accurate definition of amusement. Whatever occupies the thoughts and senses in an agreeable way, and employs them with some degree of intensity, comes under the same head.

This broad and general definition allows us to disregard our daily employments as amusements when they engage our deep attention and at the same time give us pleasure.

The term “amusements,” however, in the more popular sense, is restricted to those sports, games, plays, exhibitions, entertainments, etc., which involve a *suspension* of our daily labors, and are properly called *diversions*.

When nature is tired and worn with those severe and exhausting toils by which we earn our bread, amusements turn us aside, *divert* us, engage other powers, and allow our tired faculties to rest. They are, therefore, of very great importance. Even the most trifling amusements may have the highest value. Their very nature and object imply that they will be valuable just in proportion as they divert and rest us. And just in proportion as they do these things, they give us health.

One other thing amusements do for us, which must not be forgotten; they preserve in us, in middle life, and even in old age, the warm simplicity of childhood. They keep us young in our dispositions and feelings. They keep us in harmony with nature, and consequently artless and truthful. They prevent the formalities of conventional life from stiffening us into cold and repulsive hypocrites.

**Selection of Amusements.** — Of course the same amusements are not adapted to all persons. The farmer who has worked his muscles all day, would not be benefited by a game of ball in the evening; yet there are few games more suitable for the student who has bent for many hours over his books. Care should always be taken, therefore, that amusements or sports do not bear upon those limbs or faculties which are wearied by work.

**Amusements improve various faculties.** — To one who has a taste for art, who is fond of works of genius and poetry, theatrical entertainments will always be agreeable, and a source of gratification and health. I know these exhibitions are objected to by many as immoral and hurtful, but more, I think, from habit and fashion, than upon any solid grounds of reason or religion. They certainly appeal to a high order of faculties in the human mind; and to those who are fitted to receive them, teach lessons of great moment. Even the lower exhibitions of comedy, though not particularly improving to the mind, are yet, from their power to provoke *laughter*, among the most powerful up-builders of health.

**The Games of Whist, Euchre, etc.,** engage the minds of the players in a sort of mental contest, which is exciting, agreeable, and health-imparting. These games make us skilful in calculating chances, and judging how men ought to act under certain contingencies. They make us sharp to detect and turn aside the unseen forces, which tend to oppose and destroy our success in life.

I hardly need to say that money or rather property should never be staked upon a game of cards, or upon any other game. Gambling is one of the meanest as well as most destructive things in which men can engage. It raises the healthful excitement of these innocent amusements, — innocent when properly pursued, — into raging passions, which, when defeat comes, as come it will, sink into remorse and bitterness as terrible as the mind can conceive. I warn young men, as they would escape the pangs of a hell on earth, and the loss of character, happiness, and probably health for life, to avoid any such abuse of cards.

**Chess, Chequers, etc.,** appeal likewise to the fondness of competition, which is common to all men. But they cultivate in us a little more of the mathematical element. As they require very close application of the mind, they are not suitable for persons of sedentary employments, or whose daily avocations require a constant use of the



mind. Such persons should choose lighter and more active amusements.

**Lighter Amusements.**—Beside these higher amusements, there are a great number of lighter and more childish ones, which should not be overlooked.

Some of these are merely physical, involving a trial of strength, fleetness, action, etc., as the games of ball, cricket, etc. Others are domestic in their nature, involving mirth, and various other of the lighter excitements, as blind-man's buff, puss in the corner, hole in the wall, fox and geese, hunt the slipper, hurly-burly, roll the platter, etc.

In fashionable American households, these simple domestic plays have in a great measure gone out of use,—being deemed vulgar, and below the dignity of ladies and gentlemen. I am sorry to say this; for the vulgarity, in my judgment, is in those who reject them, and not in the play.

The officer of our navy, whose visit to the mansion of Lord Hardwick I have spoken of on page 93, reports that on the evening of one of his visits, the play of blind-man's buff was engaged in by the whole party; and that his Lordship in attempting to make a short turn during the play fell upon his back, when one of his daughters, who was blinded, caught him by the heels, and being assisted by others, drew him feet-foremost half the length of the hall, amid the shouts of the whole party. This would have been deemed very vulgar by fashionable people in this country. But to me, who am no believer in any nobility which Lord Hardwick can receive from kings or queens, this simple narrative raised him at once to a peerage in nature's realm. Without doubt, he is one of nature's noblemen. A man in his station, and with his wealth and temptations to snobbery, who can preserve such simplicity of character, must have a warm as well as a noble heart in his breast.

**Value of Domestic Amusements.**—I remark here that, in all our amusements, we should, as far as possible, seek those of a domestic character. They are more simple and childlike in their nature, and preserve in us, even to old age, the freshness of feeling, and truthful simplicity, which spread so beautiful a greenness over the autumn of life.

Simple domestic amusements, too, are always gotten up on a cheap scale; they do not encourage costly extravagance, and can be indulged in by the poor as well as the rich.

But more, and better than all, they keep young men and old men, and young women and old women, at home, by making the domestic circle the centre of attraction. They draw the seekers of pleasure around the hearth-stone, instead of outward in the world. They incline young and old to look to the *family circle* as the centre of the most pure, because the most simple and natural, enjoyments. They teach us to look to *home* as the centre of life, and to all outside as only its appendages.

It has been said that *homes* are found only in England; that in other countries, life wanders, houseless and shelterless, abroad, seeking happiness, it knows not where, while in England it nestles warmly in the bosom of home. To whatever extent this is true,—and I believe there is truth in it,—it is owing to the simple household amusements of England.

**An American Want.**—One of the great wants of this country is a more liberal provision for amusements. We attach here too much value to wealth; and we pursue it with an intensity altogether incompatible with health. We cannot take time for recreation because we are in so great a hurry to be rich.

If we would save ourselves from a total wreck of health, we must take broader and better views of life. We must value it for its solid comforts, rather than for its glitter and show.

Contrary to the general belief, insanity is very prevalent among seamen and farmers. The former lead a life of dreary solitude upon the ocean; the latter, one, if not of equal, certainly of very objectionable solitude upon the land. The sailor who does business upon the great sea should provide himself with great numbers of games to amuse him in his wanderings. The farmers of our land should cultivate more of the sociabilities of life. Let them meet together in the fine summer evenings, like the peasants of France, and dance upon the green lawns before their cottages. They will till their lands more cheerfully for it; enjoy better spirits and health; and live to greater age.

**Completeness of Life.** — Amusements are necessary in order to give a completeness to life. The faculties of the human mind are numerous. It is only when they are all exercised, in their due proportion, that there is a harmonious beauty in our lives. The customs of society twist us all out of shape, — perverting us mentally, morally, and physically, and robbing us of every manly and healthful quality. Getting out of the ruts of fashionable life, we must come back to the simple paths of nature.

I would strongly impress upon parents, teachers, and guardians, the importance of studying well the various temperaments, physical and mental peculiarities of their children, in order to judge wisely of the kind and amount of recreation required by them.

Instance: a pale, delicate child of ten to twelve or fourteen years, with clear complexion, flaxen hair, blue eyes, slender frame, and a nervous, sensitive organization, with strong mental cast, requires much more recreation and out-door exercise than a full-blooded, robust child of that age; a fact not at present duly considered, as a general thing.



TEMPERAMENTS  
AND  
CONSTITUTION of the BODY  
AND  
SYMPTOMS of DISEASES

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It is necessary that the reader should understand the temperament  
and constitution of the body and symptoms of diseases  
that they may intelligently diagnose  
the case.

# TEMPERAMENTS, CONSTITUTION, AND SYMPTOMS.

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MAN has *thinking, warming, nourishing, and moving* powers. For the performance of each of these great functions, he has organs of the best possible construction.

**For Thinking**, he has a *brain*. If this be *large in proportion to his other organs*, it gives a character, a cast, a peculiarity to his whole organization. Everything about him is subordinate to his brain. We recognize him, at once, as a thinking and feeling being. He has an intellectual *look*. There is a delicacy, a refinement, a sensitiveness, a studious habit, an air of thoughtfulness about him, which determine his traits, his tone, his temper, his whole character. Hence it is proper to say he has a *cephalic* or *thinking temperament*.

**The Lungs and Heart**, devoted to renewing and circulating the blood, are placed in the *chest* or *thorax*. If *these be large in man in proportion to other organs*, he is characterized by great activity of circulation, by a large supply of red blood, and by the general indications of a full, warm, and bounding life. This activity gives him his tone and temper, and shows that his is the *thoracic* or *calorific temperament*.

**In the Great Cavity of the Abdomen** is done the work of receiving, digesting, and disposing of the materials which nourish the body. If the organs which do this work *be large in proportion to others*, the body is fed to repletion, and the whole organization speaks of the table. The habit, the look, the temper, are all sluggish. This is the *abdominal* or *alimentary temperament*.

**The Bones and Muscles** are instruments by which the *movements* of the body are performed. If these be the largest, in proportion, of any in the body, then the locomotive powers are in higher perfection than any others. There is largeness of person, energy of movement, and greatness of endurance. The whole cast of the person partakes of the strength and coarseness of bone and muscle. This is the *muscular* or *locomotive temperament*.

This gives us four temperaments, as follows: —

**I. The Cephalic Temperament**, denoted by large brain, activity of mind, and general delicacy of organization.



**II. The Thoracic Temperament**, indicated by a large chest, force of circulation, redness of skin, great activity, warmth of temper, and fulness of life.

**III. The Abdominal Temperament**, denoted by a large development of the stomach, liver, bowels, and lymphatics; by a fulness of belly, fondness of high living, and a disposition to float sluggishly upon the current of the world, rather than to struggle against it.

**IV. The Muscular Temperament**, indicated by largeness of frame and limbs, coarseness of structure, and great power of locomotion and endurance.

There are some reasons for reckoning but three temperaments instead of four, by reducing the thoracic and abdominal to one, after the manner of the phrenological Fowlers, — especially as the organs in the chest, and their appendages, take an important part in the process of nutrition. But as the heart and lungs are placed in one cavity, and the stomach, liver, etc., in another, and as one set of these organs may be largely developed, and the other defectively, I have thought it most convenient, on the whole, and quite as philosophical, to retain the *four* temperaments.

These temperaments seldom or never appear single and pure. They mix and cross with each other in all possible ways.

### Medication and Temperaments.

THE object of speaking of temperaments in this work is to make the reader acquainted with the principles upon which remedies are to be adapted to their development. The philosophical-minded physician will, in prescribing, always keep the temperament in view.

**Persons of a Cephalic Temperament** cannot bear powerful medicines, — particularly drastic purges. Their fine, delicate and sensitive organizations would be torn all to pieces by doses which would hardly be sufficient in a fully-developed muscular temperament. This should always be borne in mind in prescribing for persons of a large brain and delicate organization.

In this temperament, too, fevers, instead of running a high and fiery course, take the low typhoid type, the patient becoming pale, and showing a constant tendency to sink. Such patients would be killed by purging, leeching, cupping, sweating, and starving. They want tonics, stimulants, and every kind of support which the case will possibly permit.

**Persons of a Thoracic Temperament**, having a rapid circulation, and a fulness of blood, are most liable to inflammatory diseases. When fever attacks them, they have what is called a "high fever." If rheumatism comes, it is *acute* rheumatism. Disease takes hold of them *smartly*. As they do everything with emphasis and energy

when well, so, when ill, they make a business of it, and are sick with all their might.

Stimulants and tonics generally make such persons worse. They want sedatives, and diaphoretics, and sweats, and purgatives, and leeches, and cups, and low diet, and cold bathing, and whatever else will slacken the ferocious swiftness of their circulation.

**Those of the Abdominal Temperament** are not particularly subject either to very high fevers, or to those typhoid forms which produce sinking. As in the two temperaments noticed above, their complaints chiefly attack the organs most largely developed. Their diseases affect the stomach, the liver, the spleen, and the bowels. These are the largest organs in their bodies, and are most used; and, being overworked, they fall into disease.

As these persons are slothful in all their habits, so their diseases run a sluggish course. They are not so liable to sudden death as persons of either of the preceding temperaments. They have all sorts of *chronic* diseases which linger a great while, and are cured with much difficulty.

These persons will bear larger doses of medicine than either of the preceding. Neither do their constitutions respond as readily to medicine. A physician will be disappointed if he expects to see them recovering as fast under its use.

**Those of a Muscular Temperament**, having little fondness for anything but a hardy, active life, are much exposed to the elements. Though strong and long-enduring, the hardship of their lives often breaks them down, and when felled by disease, they are oftentimes shockingly racked and torn by it.

These persons bear large doses of medicine, and when sick, need to be treated with an energy proportioned to the strength of their constitution. Rheumatism, which affects the joints, the ligaments, and the tendons, is an affection from which they suffer severely.

## The Constitution.

IN prescribing for disease, it is of very great importance to take notice of the constitution. This is a different matter from the temperaments. Persons of the same temperament are often quite unlike in the strength of their constitution. And those having good natural constitutions, frequently abuse them by improper habits and indulgences, and at length come to have broken and very feeble constitutions.

Some persons' muscles and other tissues are put together as if they were never intended to come apart. Like some of the woods of the forest, — the *lignum vitæ* for example, — they are fine-grained and tough. A real smart boy will wear out an iron rocking-horse sooner than one of these persons can exhaust their constitution by



hard work. Others, to outward appearance equally well made, have very little endurance, break down easily under hard work, and lose their flesh from trifling causes.

The state of the constitution, therefore, should always be learned before much medicine is given; for what a person of a strong constitution will *need*, may greatly injure a feeble person, even of the same temperament.

**Habits.**—These must likewise be attended to. Persons using stimulants require larger doses of medicine to affect them than other persons.

**Climate.**—Medicines act differently on the same persons in summer and winter. Narcotics act more powerfully in hot weather and climates than in cold, and must be given in smaller doses.

**Idiosyncrasy.**—Medicines of only ordinary activity, act very powerfully, and even violently on some persons. This is owing to a peculiarity of stomach, or constitution, called *idiosyncrasy*. It makes the person, in this particular, an *exception to the general rule*. And no physician can know beforehand in what particulars this exceptional disposition will show itself. Persons, however, learn their own idiosyncrasies, and should make them known to those who prescribe for them for the first time.

**The Sex.**—The peculiarities of each sex should never be forgotten in prescribing for the sick.

Males are not so sensitive as females. They will bear more medicine, and their nervous system is not so readily excited by it.

**Influence of Age.**—Human life is divided into *infancy*, *childhood*, *youth*, *manhood*, and *old age*. Each of these periods has peculiarities which modify disease.

**The First Period**, extending from birth to the age of seven years, is marked by tenderness and excitability, and is alive to every irritation. Teething and other disturbances occur at this period, and need careful management.

**The Second Period** extends from seven to fourteen, and is quite subject to disease, including the second dentition. During these two periods there is no great difference between the sexes; both are tender, and need careful watching.

**During the Third Period**, the changes occur which mark and separate the sexes. This is a developing period, when the functions become established, and the frame acquires form, proportion, and strength.

At this time, hereditary tendencies to disease, latent till now, begin to show themselves, and call for every possible endeavor to break them up, and fortify the constitution.

**The Fourth Period** embraces the vigorous maturity of life, when the powers of body and mind, in both sexes, are at the summit of their excellence. The functions are now well established. It is during this period that the female is subject to most of the harassing ailments peculiar to her sex. So numerous are these complaints, and so large and valued the class of persons affected by them, that he who treats them with the greatest skill, and with the delicacy which their nature demands, may be said to be at the head of his profession.

**The Fifth Period** is that of old age, when the functions are declining, and the frame is bending under the weight of years. Old age begins earlier with females than with males. Many ailments are common to this period, which require peculiar management, both medicinal and hygienic.

**Proper Frequency of Dose.**—Each succeeding dose should be given before the effect of the preceding is gone. If this rule is not attended to, the cure does not advance. What is gained by each dose is lost by the rallying of the disease in the interval. Care must be taken, however, not to apply this rule too strictly with very active medicines.

### How to Examine a Patient.

WHEN a patient is presented for examination, having observed the temperament, constitution, sex, and age,

1. Learn the causes of the disease, whether local, specific, or general, and also its history.
2. Search out its nature and character, whether febrile or otherwise.
3. Take notice of the whole train of symptoms, — embracing the pulse, the condition of the mouth, tongue, and digestive organs, the breathing, the urine, the fecal discharges, the condition of the brain and nervous system, the state of the skin, etc.

### Brief Table Explanatory of Symptoms.

#### GENERAL APPEARANCE OF PATIENT.

1. Tonic spasm of the trunk	indicates	Locked jaws.
2. Distorted features, altered position, and impaired motion of limbs	"	Paralysis of one side.
3. Irregular and perpetual motion	"	St. Vitus's dance.
4. Entire and absolute immobility	"	Catalepsy.
5. Great and unnatural boldness	"	Insanity or delirium.
6. Great and unusual languor	"	The beginning of an acute disease, or the progress of a chronic one.
7. Ability to lie only upon the back	"	Apoplexy. Organic disease of the brain or spinal marrow. Acute inflammation of the lining of the abdomen. Rheumatism of the joints.
8. Lying upon the face	"	Several kinds of colics.
9. Lying upon one side	"	Pleurisy, or inflammation of the lungs. When one lung only is affected in consumption, the patient generally lies on the diseased side.



10. Maintaining the sitting posture only	indicates	Disease of the heart or lungs, which interferes with breathing.
11. The head thrown back	"	Severe diseases of the larynx and wind-pipe.
12. Restlessness and tossings	"	The beginning of acute inflammation. Fevers. Delirium, and acute mania.
13. General enlargement of the body	"	Cell-dropsy. Emphysema from a wound of the chest.

### Head, Face, and Neck.

1. Head bent to one side	indicates	Convulsions. Paralysis of one-half the body. Dislocation of bones of neck. Swelling of glands of neck.
2. Head increased in size	"	Chronic hydropholus. Enlarged brain.
3. Swollen scalp	"	Erysipelas. Small-pox.
4. Dull expression of face	"	Typhoid fever.
5. Full, red face, with blood-vessels of eyes injected	"	Swelling of heart. Congestion of brain.
6. Pinched, contracted countenance	"	Acute inflammation of peritoneum. Exposure to severe cold.
7. Pinched nose, sunken eyes, hollow temples, skin of forehead tense and dry, complexion livid	"	Chronic disease just before death.
8. Wrinkles across the forehead	"	Excessive pain arising externally.
9. Wrinkles from forehead, vertically to root of nose	"	Distress, anxiety, and severe internal pain.
10. A white line from inner angle of the eye to just below the cheek-bone	"	In children, a brain or nervous affection; in adults, abuse of the generative organs.
11. White line from the upper border of the wing of the nose (ala nasi), curved to the outer margin of the orb of the eye	"	In consumption and wasting of flesh. The lower part of the line indicates disease of stomach; the upper part, some affection of upper part of bowel. When united with the white line named above, and with a drawing in of the cheek, fixed eyes, and a wan complexion, it implies worms.
12. The white line in children from angle of mouth to lower part of face	"	An affection of the chest, with difficulty of breathing.
13. A white line external to the last two, in a semicircular direction towards the chin	"	Chronic and obstinate disease in the chest or belly.
14. Swelling of the face and eyelids	"	Albumen in the urine.
15. Transient redness or flushing of face	"	Suffering from the monthly irregularity.
16. Hectic flush	"	Consumption. Chronic affections.
17. Paleness of face	"	Cold stage of fever. Acute inflammation. Chronic diseases, especially Bright's disease, during recovery.
18. Dingy, white, or greenish face	"	A low and deficient state of blood.
19. Yellow tint	"	Jaundice.
20. A citron tint	"	Cancerous disease.
21. A bluish tint	"	Poor circulation in the veins. Cholera. Typhus fever. Blue disease.
22. Perpetual motion of eyelids	"	Mania and idiocy.
23. Forcible closure of eyelids	"	Intolerance or dread of light.
24. Eyelids remaining open	"	Orbicularis palpebrarum. Paralysis of the muscle which closes the eye.
25. Palsy of the upper lid	"	Injury of the third pair of nerves.
26. Flowing of tears over the cheek	"	Obstruction of the lachrymal duct.
27. Nostrils dilating forcibly and rapidly	"	Difficulty of breathing.
28. Itching of nostrils in children	"	Worms in the bowels.

### The Tongue.

1. Surface of tongue covered with a layer of whitish, soft, mucous substance, which may partially be taken off with a scraper, also, clammy mouth	indicates	Derangement of stomach, or bowels, or both.
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2. State of tongue as above, with clammy mouth, bitter taste, and fetid breath.	indicates	Acute dyspepsia. Asthma.
3. Great load on tongue as above, which <i>peels off</i> , leaving the tongue smooth, red and tender	"	Severe cases of acute dyspepsia.
4. Tongue slightly white from small white points, and sometimes covered with fur, like the fibres of coarse velvet	"	Chronic dyspepsia. Some affection of the liver, if the fur be yellow.
5. Tongue pale, tumid, clean and very smooth	"	Chlorosis or green sickness.
6. Tongue <i>furred</i> and <i>dry</i>	"	Violent local inflammation. Irritation in bowels.
7. Tongue white and loaded, with much thirst	"	Inflammatory fever.
8. As above at first, — afterwards clean, red, and dry	"	Protracted inflammatory fever.
9. Tongue white and loaded, with dryness	"	Mild typhus fever.
10. Tongue dry, parched, tender, and dark brown or black. Pushed out with great difficulty and trembling	"	Severer forms of typhus fever.
11. Tongue loaded with white, through which numerous elongated, very red papillæ protrude their points	"	Scarlet fever.

### The Throat.

1. Throat enlarged	indicates	The approach of puberty in females.
2. Violent pulsation of carotid arteries	"	Acute mania. Inflammation of brain. Enlargement of heart, and dilation of right ventricle. Anemia.
3. Pulsation of the nameless artery (arteria innominata) above the breast bone, and to the right of the windpipe.	"	Regurgitation from aorta.
4. Circumscribed swelling about throat	"	Enlargement of glands.

### The Chest.

1. General enlargement of one side of chest	indicates	Large effusion of water from pleurisy.
2. Bulging at the base of a lung	"	Water from pleurisy settling to the bottom.
3. Bulging at front upper part of chest	"	Emphysema.
4. Bulging right hypochondrium (See Fig. 95)	"	Enlargement of liver.
5. Bulging in region of heart	"	Water in heart-case. Enlargement of heart.
6. Tumor where the third rib joins the breast-bone	"	Aneurism of the ascending aorta.
7. Tumor between the base of the shoulder blade and the spine	"	Aneurism of the descending aorta.
8. Depression or retraction of one side of chest	"	Consumption. Absorption of fluid, effused by pleurisy.
9. Breathing increased in rapidity. Generally, in health, about twenty breaths are taken in a minute	"	Spasmodic asthma.
10. Breathing diminished in rapidity	"	Pleurisy. Paralysis of respiratory muscles. Inflammation of lungs. Emphysema. Pneumothorax. Consumption.
11. Jerking respiration	"	Spasmodic asthma. Obstruction in larynx and windpipe.
12. Breathing with muscles of ribs only	"	Abdominal inflammation. Inflammation of diaphragm.

### The Belly.

1. Increased size of belly	indicates	Dropsy. Wind in bowels. Inflammation of peritoneum. Obstruction in bowels. Hysteria.
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|---|---|
| 2. Enlargement in epigastrium (Fig. 93) indicates | Hysteria. Cancer of stomach.  |
| 3. Enlargement in hypogastrium (Fig. 95) "        | Distension of bladder. Ovarian tumors. Accumulation of feces in bowels. |
| 4. Belly diminished in size                       | " Chronic dysentery. Lead colic. Also in most chronic diseases.         |

### Private Organs.

- |                               |           |                                    |
|-------------------------------|-----------|------------------------------------|
| 1. Enlarged penis in children | indicates | Stone in bladder. Masturbation.    |
| 2. Drawing up of testicles    | "         | Stone in kidneys.                  |
| 3. Enlargement of scrotum     | "         | Hydrocele. Hematocele. Sarcocoele. |

### The Limbs.

- |                               |           |  |
|-------------------------------|-----------|--|
| 1. The limbs immovable        | indicates | Paralysis.                                       |
| 2. Limbs contracted and rigid | "         | Softening of the brain.                          |
| 3. General swelling of limbs  | "         | Defective circulation of blood.                  |
| 4. Swelling of joints         | "         | Rheumatism. Water in the joints. White swelling. |
| 5. Limbs diminished in size   | "         | Paralysis.                                       |

### The Nervous System.

- |   |           |   |
|---|-----------|---|
| 1. Morbidly increased sensation                         | indicates | Acute inflammation of brain and spinal marrow. Fevers. Hysteria.  |
| 2. Tensive pain   | "         | Phlegmonous inflammation.   |
| 3. Dull, heavy pain                                     | "         | Enlarged internal organs. Internal tumor. Effusion of water into cavities lined with serous membranes. Felt in the loins previous to discharge from menstruation, and from piles. |
| 4. Smarting pain  | "         | Scarf-skin removed.   |
| 5. Shooting, tearing pains                              | "         | Neuralgia. Cancer.  |
| 6. Boring pains   | "         | Constitutional syphilis. Rheumatism. Gout. Inflammation of periosteum.  |
| 7. Contusive pains.                                     | "         | Bruises. Acute diseases.  |
| 8. Itching. Sensation as of ants creeping over the skin | "         | Several diseases of the skin.   |
| 9. Exaltation of vision                                 | "         | Ophthalmia. Inflammation of brain. Some nervous diseases.   |
| 10. Black flecks floating before the eyes               | "         | Affections of the brain and optic nerve. Dyspepsia.   |
| 11. Painfully acute hearing                             | "         | Inflammation of brain. Hysteria.  |
| 12. Dull hearing  | "         | Typhus fever.   |
| 13. Increase of strength                                | "         | Delirium. Inflammation of brain. Mania.   |
| 14. Debility  | "         | Most diseases.  |
| 15. Trembling   | "         | Cold stage of fever. Nervous affections. Old age. Action on the system of lead, mercury, strong coffee, alcoholic drink, tobacco, opium.  |
| 16. Rigidity of upper extremities                       | "         | Softening of the brain. Infiltration of blood into the brain. Hysteria.   |
| 17. Cramp   | "         | Pregnancy. Hysteria. Painters' colic.   |
| 18. Temporary spasm                                     | "         | In convulsions of children. Some affections of the brain.   |
| 19. Pain at extremity of penis                          | "         | Stone in bladder.   |
| 20. Pain in right shoulder                              | "         | Congestion of liver.  |
| 21. Pain in left shoulder                               | "         | Disordered stomach.   |
| 22. Exaltation of affections                            | "         | Hypochondriasis.  |
| 23. Loss of moral sensibility                           | "         | Mania. Typhus fever. Masturbation.  |
| 24. Exaltation of intellect                             | "         | Melancholy. Sometimes indicates close of life.  |

### The Breathing.

- |                        |           |  |
|------------------------|-----------|--|
| 1. Stiffness of chest  | indicates | Cartilages turned to bone. Pleura hardened. Distortion from rickets. |
| 2. Pressure upon parts | "         | Tumors. Dropsy of belly.   |

3. Obstruction of air-tubes	indicates	Spasm of glottis. Spasm near the small ends of bronchial tubes. Mucus, etc., thrown out upon the inner surface.
4. Compression of lungs	"	Effusions in pleurisy. Water in chest. Air in substance of lungs. Aneurism and other tumors.
5. Pain in parts moved in breathing	"	Pleurisy. Inflammation of peritoneum.
6. Paralysis of muscles of chest	"	Injury of spinal marrow.
7. Spasm of muscles of chest	"	Locked jaw. Spasmodic asthma.
8. Deficiency of red blood	"	Anæmia. Chlorosis or green sickness.

### The Cough.

1. Hollow and barking cough	indicates	Last stage of consumption. Chronic bronchitis. Some nervous affections.
2. Sharp, ringing cough	"	Croup.
3. Hoarse cough	"	Beginning of cold. Chronic laryngitis.
4. Wheezing cough	"	Asthma.
5. Belching cough	"	Some diseases of larynx.
6. Cough in paroxysms	"	Whooping cough. Hysteria.
7. Cough sounding harsh and concentrated when listening with the stethoscope.	"	Consumption. Inflammation of the lungs. Pleurisy. Enlargement of bronchial tubes.
8. Cough sounding hollow, when listening with the stethoscope, as though it came from a cavern.	"	Tuberculous cavity. Enlarged bronchial tubes.
9. Cough having a metallic or ringing sound when listening with the stethoscope.	"	Large tuberculous cavity.

### The Expectoration.

1. Scanty expectoration	indicates	First stage of acute diseases of the lungs.
2. Copious expectoration	"	Decline of acute diseases of air-passages and lungs.
3. Watery expectoration	"	Beginning of bronchitis. Congestion of lungs. Vesicular emphysema.
4. Mucous expectoration	"	Bronchitis. Inflammation of lungs.
5. Expectoration of pus	"	Consumption. Third stage of inflammation of lungs.
6. Expectorated matter shaped like coin (nummular)	"	Tubercular consumption. Bronchitis of measles.
7. Muco-purulent, flocculent expectoration	"	Consumption far advanced.
8. Tubular expectoration	"	Plastic bronchitis. Pneumonia.
9. Whitish or greenish expectoration, that clings to the vessel	"	Acute affections of lungs, particularly bronchitis
10. Yellow expectoration	"	Chronic bronchitis. Other chronic affections of the lungs and throat.
11. Rusty expectoration	"	Inflammation of the lungs.
12. Putrid smell of expectoration	"	Gangrene of the lungs.
13. Faint and sweetish smell of expectoration.	"	Bronchitis. First stage of consumption.
14. Expectoration smelling like garlic	"	Broncho-pleural fistula.

### Pain.

1. Dull, heavy, aching pain at the base of the chest	indicates	Acute bronchitis.
2. Soreness about the breast bone, and between the shoulders	"	Acute bronchitis.
3. Sharp, sudden, tearing pain below the nipple	"	Pleurisy.
4. Pain darting from front part of chest to between shoulder blades	"	Consumption.
5. Constant pain between the shoulders	"	Consumption. Green sickness. Other chronic diseases.



### The Pulse.

1. Strong pulse, resisting compression by the finger	indicates	Inflammatory affections, especially of the substance of large organs, as the liver, etc.
2. Weak pulse, easily pressed down	"	Prostration from disease. Nervous and chronic affections. Fear. Diseases of women and children, and old persons.
3. Full pulse, as if the artery were increased in size	"	Congestion of brain. Apoplexy. Disease of heart.
4. Small pulse, opposite of full	"	Inflammation of stomach, bowels, bladder, etc. Hysteria, and other nervous affections.
5. Hard, sharp, contracted pulse, — vibrating like a cord under the finger	"	Inflammation of membranes. Active bleedings. Lead colic, etc.
6. Soft pulse, yielding readily to pressure	"	Affections characterized by debility.
7. Frequent pulse	"	Inflammatory diseases. Hemorrhages.
8. Slow pulse	"	Apoplexy. Sometimes in disease of heart.

### Relating to Digestion.

1. Tongue trembling and dry, and diminished in size	indicates	Typhoid and other low fevers.
2. Voracious appetite	"	Pregnancy. Hysteria. Insanity. Sometimes in dyspepsia.
3. Diminished appetite	"	In most acute diseases.
4. Increased thirst	"	Acute affections of stomach and bowels.
5. Thirst gone	"	Cerebral disease, with coma.
6. Vomiting	"	Early pregnancy. Colic. Disease of brain. Inflammation of stomach. Hernia.
7. Pain increased by pressure	"	Inflammation of internal organs.
8. Pain relieved by pressure	"	Over-distension of bowels. Neuralgia. Colic.
9. Urgent desire to go to stool	"	Dysentery. Sometimes in diarrhœa.
10. Watery stools	"	Diarrhœa. Cholera.
11. Mucous stools, like white of egg	"	Chronic inflammation of colon.
12. Hard and lumpy stools	"	Constipation. Colic. Cancer of stomach.
13. Clay-colored stools	"	Deficiency of bile.
14. Yellow or dark-brown stools	"	Too much bile.
15. Dark-green stools	"	Bile from children after taking calomel.
16. Stools red, and streaked with blood	"	Dysentery.
17. Pitchy black stools	"	Melœna.
18. Stools pure blood, with no colic	"	Bleeding piles.
19. Stools like rice-water	"	Asiatic cholera.
20. Black stools	"	Iron taken in medicine.
21. Shreds of false membrane in stools	"	Dysentery. Diarrhœa. Worms.
22. Fat with stools	"	Diabetes. Consumption.
23. Fetid stools	"	Diseases attended by debility.

### The Urine.

1. Diminished secretion of urine	indicates	Dropsy. Inflammatory and febrile diseases.
2. Retention of urine in the bladder	"	Paralysis. Typhoid fever. Hysteria.
3. Urine increased in amount	"	Diabetes. Cold stage of fevers. Hysteria. Various passions of the mind.
4. Red or yellow sand deposits in urine (uric acid)	"	Fevers. Acute Rheumatism. Consumption. Dyspepsia. Great indulgence in animal food.
5. White sediment in urine (earthy phosphates)	"	Depressed state of the nervous system, of serious import.
6. Oxalate of lime deposits in urine	"	Derangement of digestion.
7. Blood in urine	"	Bleeding of kidneys, etc.
8. Albumen in urine	"	Bright's disease.
9. Mucus in urine	"	Inflamed mucous membrane of urethra, bladder, etc.
10. Sugar in urine	"	Diabetes.

### The Perspiration.

1. Profuse perspiration	indicates	Acute rheumatism. Decline of acute inflammations and fevers, being sometimes critical.
2. Diminished perspiration	"	Early stage of acute disease. Dropsy. Diabetes.
3. Night sweats	"	Consumption.
4. Sour-smelling sweat	"	Rheumatism. Gout.
5. Fetid smelling sweat	"	Some debilitating fevers.
6. Sweat with mouldy odor	"	Measles. Scarlet fever.
7. Smelling like ammonia	"	Typhoid fever sometimes.
8. Sweat having the odor of mice	"	Insanity.
9. Sweat smelling like rottenstone	"	Miliary.

### The Temperature.

1. General heat of surface	indicates	Fevers.
2. External local heat		Inflammation.
3. Hot forehead	"	Headache.
4. Hot scalp	"	Disease of brain.
5. Skin of chest hot	"	Inflammation in chest.
6. Hands and feet hot.	"	Consumption.
7. Acrid heat, burning the hand when applied	"	Typhus fever.
8. Chills	"	Beginning of fever.
9. Low temperature	"	Poor circulation.
10. Cold hands and feet	"	Nervous diseases. Dyspepsia. Impure state of the blood.

### The Temperature of the Body.

THE use of the thermometer is an important addition to the means of making physical examination, and is one of the improvements in modern medicine.

It is intended to measure the heat of the body.

The best kind now in use is the self-registering.

The bulb of the instrument is to be placed in the warmest part of the body, and should be allowed to remain there for eight to ten minutes.

Some place it under the tongue ; some in the axilla.

Sometimes it is necessary to introduce it into the rectum or vagina. In these parts the temperature is a degree higher than in other parts.

The normal temperature of the body is from 98° to 99° Fahrenheit, in the great majority of persons.

Exceptionally it may be half or a whole degree either above or below this range.

The normal fluctuations are inconsiderable in comparison with the variations of disease.

The natural variations in health are as follows: The temperature is at its minimum at five o'clock A. M. ; the maximum is reached in the latter part of the afternoon, and then decreases till five o'clock A. M.

By means of the thermometer we are able to determine all differences with precision.



The increase of heat in different febrile diseases rarely exceeds 110° Fahrenheit, and as a rule the amount of increase is a criterion of its severity.

An increase to 100° Fahrenheit or 101° is evidence of mildness of the disease.

If the thermometer indicates steadily 105° Fahrenheit, it is certain that the disease is severe.

A persisting temperature above 105° Fahrenheit denotes that there is great danger, and an increase to 108° to 110° Fahrenheit is usually a fatal sign.

The abnormal changes of temperature consist of more or less increase.

Diminution below the normal standard is comparatively rare; yet it sometimes occurs and is of some importance.

In the course of typhoid fever, a sudden decrease may indicate intestinal hemorrhage. Sometimes the temperature falls without improvement in the other symptoms. This is an unfavorable symptom.

The value of thermometric changes depends in no small measure upon the symptoms with which they are associated.

### **Sickness during Life.**

It is estimated that 2 years' sickness is experienced by every person before they are 70 years old, and that 10 days per annum is the average sickness of human life. Till 40 it is half, and after 50 increases. The miscellaneous diet of man is the cause of many diseases.

### **Human Longevity.**

OF 100,000 male and female children, in the first month of life they are reduced to 90,506 or nearly a tenth. In the second to 88,155. In the third to 85,976. In the fourth to 85,139. In the fifth to 84,122. In the sixth to 82,635, and by the end of the first year to 76,938, the deaths being 2 in 10. The next four years reduces the 76,938 to 63,048, indicating 36,952 deaths before the completion of the fifth year.

At 25 years the 100,000 are about half, or 49,695; at 55 about a third; at 59 about a fourth, or about 25,000; at 67 about a fifth; at 75, a tenth; at 80, a twentieth, or 5,000, and 10 attain 100 years.

About the age of 35 the lean man usually becomes fatter, and the fat man leaner. Again, between the years 45 and 50 is generally a critical time in a man's life, his appetite fails, he becomes logy, and tires easily upon the least exertion of body or mind. His muscles become flabby, his spirits droop and his sleep is poor and unrefreshing. After suffering under these complaints a year or two, he seems to acquire new vigor, and goes on to 62 or 63, when a similar change takes place, but when improvement comes he is apt to go on to a ripe old age.

## Strength and Warmth Derived from Different Articles of Food and Drink.

Strength derived from articles  
of food and drink.

Grains of Strength yielded by  
one pound of 7,000 grains.

	Grains
Parsnips, . . . . .	12
Turnips, . . . . .	13
Whey, . . . . .	13
Greens, . . . . .	14
Potatoes, . . . . .	24
Skimmed Milk, . . . . .	35
New Milk, . . . . .	35
Buttermilk, . . . . .	36
Barley, . . . . .	70
Rice, . . . . .	70
Bacon, . . . . .	78
Rye Bread, . . . . .	89
Baker's Bread, . . . . .	90
Fresh Pork, . . . . .	109
Corn Meal, . . . . .	125
Fresh Fish, . . . . .	129
Cocoa, . . . . .	130
Oatmeal, . . . . .	140
Mutton, . . . . .	140
Fresh Beef, . . . . .	173
Beef Liver, . . . . .	200
Split Peas, . . . . .	250
Cheddar Cheese, . . . . .	310
Skim Milk Cheese . . . . .	361

Warmth derived from one  
pound of different articles of food

Grains of Warmth yielded by  
one pound of 7,000 grains.

	Grains
Whey, . . . . .	151
Turnips, . . . . .	238
Buttermilk, . . . . .	335
Skimmed Milk, . . . . .	352
New Milk, . . . . .	378
Carrots, . . . . .	390
Parsnips, . . . . .	426
Potatoes, . . . . .	770
Fresh Fish, . . . . .	980
Beef Liver, . . . . .	1,220
Red Herrings, . . . . .	1,456
Baker's Bread, . . . . .	1,990
Fresh Beef, . . . . .	2,300
Molasses, . . . . .	2,300
Skim Milk Cheese, . . . . .	2,355
Seconds Flour, . . . . .	2,700
Rye Bread, . . . . .	2,700
Rice, . . . . .	2,755
Barley Meal, . . . . .	2,780
Indian Meal, . . . . .	2,806
Sugar, . . . . .	2,900
Fresh Pork, . . . . .	3,100
Bacon, . . . . .	4,201
Butter, . . . . .	4,700
Lard, . . . . .	4,806



The stature of the body at birth  
and subsequent ages.

The additional length of life a per-  
son is expected to live after reaching  
the age of 20 years and each subse-  
quent year to 70 years old.

STATURE OF MALES			STATURE OF FEMALES			YEARS		YEARS	
Age	Feet	Lbs.	Age	Feet	Lbs.	Age	Expec- tancy	Age	Expec- tancy
0	1.65	7.05	0	1.63	6.42	20	41½	46	24
2	2.60	25.02	2	2.55	23.53	21	40¾	47	23¼
4	3.05	31.38	4	3.01	28.67	22	40	48	22½
6	3.44	38.81	6	3.38	35.29	23	39½	49	22
9	4.01	49.95	9	3.93	47.10	24	38¾	50	21¼
11	4.36	59.78	11	4.26	56.57	25	38	51	20¼
13	4.73	75.81	13	4.61	72.65	26	37¼	52	19¾
15	5.08	96.40	15	4.92	89.04	27	36½	53	19
17	5.36	116.56	17	5.10	104.34	28	35¾	54	18¼
18	5.44	127.60	18	5.15	112.55	29	35	55	17¾
20	5.50	132.46	20	5.16	115.30	30	34½	56	17
30	5.52	140.38	30	5.18	119.82	31	33¾	57	16¼
40	5.52	140.43	40	5.18	121.81	32	33	58	15½
50	5.50	139.96	50	5.05	123.86	33	32½	59	15
60	5.38	136.08	60	4.98	119.76	34	31¾	60	14½
70	5.32	131.28	70	4.97	113.60	35	31	61	14
80	5.29	127.55	80	4.95	108.80	36	30½	62	13½
90	5.28	127.54	90	4.94	108.81	37	29¾	63	13
						38	29	64	12½
						39	28¼	65	11¾
						40	27¾	66	11¼
						41	27	67	10¾
						42	26½	68	10¼
						43	25¾	69	9¾
						44	25¼	70	9¼
						45	24½		

Weight of the Human Body.

THE weight of the male at birth is 7 lbs., that of the female is about 6½ lbs. The maximum weight (140½ lbs.) of the male is attained at 40; that of the female (nearly 124 lbs.) is attained at 50. The full grown adult is 20 times as heavy as a new-born infant. In the first year he triples his weight. At an equality of age the male is heavier than the female. Towards the age of 12 years only, an individual of each sex has the same weight.

Children lose weight the first three days after birth; at the age of a week their weight gradually increases; after 1 year they triple in weight and require 6 years to double their weight, and 13 to quadruple it.

# SYMPTOMS

**That quickly tell what your complaint is.**

## Backache.

**Leucorrhea.** *Whites.*—Discharge from the vagina (catarrh) slight or profuse; thin, glairy; thick, lumpy or stringy; watery or milky; yellowish, greenish, bloody or purulent; odorless or offensive; bland or excoriating, with heat, burning and itching of genitals; headache; dizziness; backache; indigestion.

**Displacement of the Uterus.**—Weight in lower abdomen; pressing and bearing down sensations; disturbances of menstruation; backache.

## Bowels.

**Hernia.** *Rupture.*—May be protrusion of intestines in groin, which can be pushed back; or strangulated, when not reducible, with inflammation, pain, nausea, vomiting, constipation, cold sweat, anxiety, gangrene.

**Colic, Intestinal.**—Paroxysms of severe, twisting or boring pain, centering about navel, radiating through abdomen, better from friction and pressure; abdomen usually distended; may be cold sweat, feeble pulse, and vomiting.

**Inflammation of the Bowels.**—Colicky pains in the bowels; diarrhoea, with thin, liquid stools containing undigested food and mucus, sometimes blood-streaked; tenderness; high fever; rapid pulse; patient lies on back, with legs drawn up.

**Peritonitis, Acute.**—Sudden onset, with chill; sharp, and cutting pains in abdomen, with great tenderness; distention of bowels with gas; high fever; hiccough; nausea, vomiting, and constipation; patient lies on back with knees drawn up; pulse small, rapid, "wiry."

**Dysentery.**—Constant desire to evacuate the bowels, with much straining, and never-get-done feeling; small stools containing mucus and blood; pain; tenderness; prostration.

**Cholera Morbus.**—Cramps in the stomach and abdomen; vomiting and purging of bilious matter; frequent and copious evacuations; thirst; moderate fever; headache; great prostration; coldness of extremities.



**Cholera Infantum.**—Vomiting and purging; thin, watery, musty smelling stools; intense thirst; great restlessness; hollow eyes; pinched, pale face; rapid, feeble pulse; rapid emaciation; great exhaustion.

### Chills.

**Influenza.** *La Grippe.*—Abrupt onset; great prostration; chilliness; stiffness, bruised pain in muscles of neck, back and legs; severe pain in head; sneezing, hoarseness and paroxysmal hard cough; running from nose; breathing difficult; or acute nervous symptoms with sleeplessness, intolerable pain in head, delirium, meningitis or severe gastric disturbance or symptoms as in typhoid fever.

**Bronchitis, Acute.**—Chilliness; debility; soreness and constriction behind breast bone; slight fever; irritative, dry, painful cough becoming loose, with partly mucous, partly purulent expectoration; difficult breathing.

**Mumps.**—Chilliness; debility; moderate fever; pain in angle of the jaw; doughy swelling of parotid gland; often swelling of other glands under one or both sides of jaw, and in throat; increase of saliva; may be sympathetic swelling of breasts or testicles.

**Bright's Disease, Acute.**—Chill followed by fever; nausea; face puffy; extremities swollen and dropsical; dull pain over kidneys, extending downward; frequent urination; quantity of urine diminished; urine smoky, reddish, turbid and contains albumen.

**Bright's Disease, Chronic.**—Slower development of symptoms as in acute form; general debility; headache; indigestion; lassitude; nausea; drowsiness; much swelling and dropsy.

### Cough.

**Bronchitis, Chronic.** *Winter Cough.*—Persistent cough, with more or less partly mucous, partly purulent expectoration; soreness behind breast bone; shortness of breath; oppression; rales in chest.

**Croup, False Membranous.**—Peculiar ringing cough, becoming muffled; hoarseness and difficult breathing continue after a spasm passes; false membrane is coughed up; great restlessness and agitation; clutching at the throat.

**Whooping Cough.**—In the beginning, slight fever, sneezing, running from the nose, dry cough; in one or two weeks cough more violent and in hard paroxysms, with eyes congested, face bluish, veins disturbed, often vomiting, may be nosebleed, long drawn, shrill whoop at end of paroxysm.

**Asthma.**—Sudden attacks generally at night; great oppression in chest; distressed breathing, cannot "catch his breath;" profuse perspiration; face pale and anxious; cough and expectoration of thick, tenacious mucus; loud wheezing in chest.

## Constipation.

**Prolapsus Ani.**—Descent or protrusion of mucous membrane of lower bowel through the anus; irritation; constipation; straining at stool.

**Piles.**—Veins of rectum distended in little lumps; may protrude, bleed, itch, be sore, cause or aggravate constipation.

## Depression.

**Hydrophobia.**—Anxiety; depression; restlessness; pain in wound; slight fever; increasing difficulty in swallowing; spasm of muscles of neck, especially at sight of water; salivation; convulsions; delirium; exhaustion; suffocation; heart failure.

**Opium Poisoning, Chronic.**—Loss of flesh and strength; trembling; debility; sallow complexion; loss of appetite; disturbed sleep; mental depression; irritability; tendency to lie and deceive; irresistible craving for the drug.

## Eyelids.

**Stye.**—Small, painful boil on eyelid, with heat, redness, swelling, and rapid suppuration.

**Tracoma.**—Inflammation and thickening of the lining membrane of the eyelids, with formation of granulations on inner side of lids.

## Ear.

**Inflammation of Middle Ear. *Otitis Media.***—Inflammation; pain; swelling of the drum and lining membrane of middle ear; watery discharge; with suppurating form, acute pain; ringing in ear; deafness; fever; formation of pus; bulging of drum which may rupture.

## Fever.

**Chicken Pox.**—Fever; chilliness; sparse, superficial eruption of crop of pimples, most abundant on the trunk, drying up in two or three days, with depressed, blackish crust in centre.

**Fever and Ague.**—Debility; nausea; vertigo; shivering, increasing to severe chill, with chattering of teeth; "goose skin"; hurried shallow breathing; small, rapid pulse. Chill, followed by fever, with face flushed; eyes red; pulse full and rapid; pain in back and limbs; intense thirst; urine scanty. Hot stage followed by free perspiration; decline of fever; increase of urine.

**Scarlet Fever.**—Vomiting or convulsions; may be a chill; high fever; rapid pulse; heavily coated, then bright red, swollen tongue; throat red, sore; swallowing painful; glands enlarged; great thirst;



scanty urine; fine, diffuse, red rash first on neck and chest; lasting five to seven days, and disappearing momentarily on pressure; eruption leaves branny scales; great restlessness, sleeplessness, headache, often convulsions.

**Typhoid Fever.**—Gradual onset with headache, debility, vague pains, nosebleed, may be slight diarrhoea, loss of appetite, then gradual rise of temperature, lower mornings, higher evenings; abdomen swollen and tender; with rose-colored spots on abdomen seventh to ninth day; spots disappear on pressure; gurgling in abdomen; pea soup diarrhoea; tongue becomes dry, brown; teeth and lips covered with sticky deposit; delirium or stupor; bleeding from bowels; picking at bed clothes.

**Typhus Fever.**—Sudden pain in head, back and legs; extreme prostration; fever reaching 104 to 105° in from two to three days, and remaining high about two weeks; rapid, weak pulse; musty odor; face livid and dull; pupils of eyes contracted; coarse, mulberry rash fourth or fifth day on trunk and extremities; urine scanty; marked nervous symptoms; bowels constipated.

**Yellow Fever.**—Chill, pain in head, back and limbs; rapidly rising fever; vomiting; thirst; constipation; then remission of symptoms for six hours, followed by their acute return; jaundice of skin; black vomit; bleeding from mouth, bladder, etc.; scanty or suppressed urine; great prostration; collapse and death or slow convalescence.

**Smallpox.**—Chill or series of chills, followed by vomiting and intense pain in small of back; rapidly increasing fever, falling the third or fourth day; rising again seventh or eighth day; pulse full, rapid; skin dry; breathing hurried; red spots first on forehead, face and wrists having hard, shot-like feel; skin between is swollen; soft, yellow, offensive crusts; spots may run together or black and blue spots form.

**Rheumatic Fever.**—Sudden reddening, swelling and tenderness of one of the large joints, with intense pain; sudden shifting of symptoms to another joint; moderately high fever; rapid, bounding pulse; scanty urine; no appetite; constipation; heavily coated tongue.

**Cholera, Asiatic.**—Vomiting alternating with painless diarrhoea; frequent, sudden rice-water movements from bowels; excruciating cramps in calves of legs, thighs, arms, and abdomen; face pinched, blue, sunken; cold, clammy sweat; pulse thready, weak; breath cool; voice husky; collapse and stupor.

**Inflammation of Spinal Cord, Acute.**—Moderate fever; loss of appetite; coated tongue; constipation; followed by radiating pains from back to limbs, with numbness, tingling or burning; pain about waist; loss of motion of limbs and increasing paralysis.

**Spotted Fever.** *Epidemic Cerebro-spinal Meningitis.*—Sudden onset; chill followed by fever; nausea; great thirst; vomiting; severe, continuous headaches; painful stiffness and retraction of muscles of the neck; dusky mottling of the skin.

**Measles.**—Sneezing; hoarseness; cough; running from eyes and nose; eyes red and sensitive to light; moderate fever; eruption of small pale or dark red velvety spots on face, then on trunk and extremities, with itching and burning; eruption lasts four days to a week.

## Heart.

**Weak Heart.**—Palpitation, with feeling of oppression about chest; fluttering, irregular pulse; headache; dizziness; bloodlessness; debility; indigestion.

**Enlargement of the Heart.** *Hypertrophy.*—When excessive there may be weight and discomfort in the chest; bulging of chest wall; a heaving impulse of heart against chest; shortness of breath; headache; vertigo; ringing in the ears; paroxysmal cough; palpitation; indigestion; sleeplessness.

**Neuralgia of the Heart.** *Angina Pectoris.*—Sudden attacks of excruciating pain in the heart, with horrible sense of suffocation; face pale and cold; pulse variable, often weak and irregular; pain in left shoulder; attack passes off with belching of gas.

**Inflammation of the Heart.**—Pain in region of the heart, sense of oppression; anxiety; difficult breathing; fever; slight cough; headache; vertigo; may be nausea; irregular action of heart; palpitation.

## Headache.

**Chlorosis.** *Green Sickness.*—Impoverished blood at puberty; greenish pallor of skin; palpitation; indigestion; nosebleed; irritability; appetite for chalk, slate pencils, etc.; debility.

**Brain Fever.**—Intense headache; vertigo; intolerance to light and sound; restlessness; heat in head; eyes bloodshot; fever; later, drowsiness and inclination to vomit; convulsions in children; rapid, feeble pulse.

## Insensibility.

**Epilepsy.**—Peculiar, premonitory sensation beginning in finger or toe, followed by sharp cry, and sudden fall to the floor, with partial or complete loss of consciousness, frothing at mouth; biting of the tongue; clenching of fingers; face becomes bluish; pupils dilated; stupor for a varying period follows, or immediate consciousness with soreness, weakness and mental confusion.

**Hysteria.**—Convulsive seizures simulating epilepsy, but patient generally falls in a comfortable place; is only apparently unconscious;



screams, cries, or laughs; urine often retained; sensation of ball in the throat; headache as of nail in the head; may be partial paralysis, or legs and arms thrown wildly about.

**Apoplexy.**—Patient suddenly falls unconscious; face flushed; breathing labored; pulse full and slow; paralysis on one side; tongue protruded; may be convulsions, and involuntary passage of urine and feces.

**Catalepsy.** *Trance.*—Patient apparently insensible; lies quiet; limbs remain in any position they are placed; muscles stiff and unyielding.

**Sunstroke.**—Weakness, dizziness and faintness after exposure to heat, or partial or complete unconsciousness; pallor of face; cold sweat; shallow, hurried breathing; or dry, burning skin; face and eyes congested; pulse full and rapid; pupils contracted; stupor; a dangerous form.

**Paralysis.**—Attack preceded by numbness, coldness, paleness, and slight convulsive jerking or twitching, followed by loss of motion partial or complete, and of upper or lower half of body, or one or both sides; may be loss of speech and other faculties.

## Lungs.

**Bleeding from the Lungs.**—May be preceded by cough, difficult breathing, warmth or tenderness in chest, salty taste in mouth; blood may gush up or be coughed up, will be bright red, fluid, and frothy, and taste sweetish or salty.

**Pneumonia.** *Lung Fever.*—Sudden hard chill and sharp pain in the side, with sharp rise of temperature, generally falling suddenly to normal the fifth, seventh or ninth day; shallow, very rapid, difficult breathing; short, dry, hard cough, later with blood-streaked, rusty expectoration, becoming free and like prune juice; pain in chest; no appetite; tongue coated; thirst, scanty urine; congestion and consolidation of lungs; may be typhoid symptoms.

**Consumption.** *Pulmonary Tuberculosis.*—Fatigue and short breath on slight exertion; loss of appetite; imperfect digestion; paleness, with hectic flush over cheek bones; irregular fever; hacking cough, at first dry, later with increasing expectoration; night sweats; loss of weight; bleeding from lungs; may be diarrhoea; tubercle bacillus in expectoration; contraction of chest; swelling of feet.

## Nose.

**Hay Fever.**—Great susceptibility to pollen of rag weed, hay, roses, etc.; redness of eyes, swelling of eyelids; sneezing; running from eyes and nose; obstruction of nose; headache; cough; may be asthma.

**Catarrh, Chronic Nasal.**—Mucous or partly mucous, partly purulent discharge from nose, obstruction of nostrils; mouth breathing; nasal voice; headache in forehead; dropping of secretions into throat; frequent hawking; may be deafness and loss of taste or smell.

## Pain.

**Inflammation of the Liver.**—Drawing sensation on the right side in region of the liver; slight chill; fever; headache; indigestion; loss of appetite; may be nausea and vomiting; slight jaundice; scant urine; sometimes hiccough; weakness; loss of flesh.

**Lockjaw.** *Tetanus.*—Painful, increasing stiffness of the head, neck, and pain extending to back, abdomen and extremities; corners of mouth drawn upward; jaws tightly closed; body convulsively arched or rigidly straight; slightest touch causes spasm with great pain.

**Pleurisy.**—Sharp, stabbing pain in the side, worse on deep breathing and motion; breathing feeble, shallow and rapid; slight, irritative cough; scanty, frothy expectoration; may be effusion of fluid into covering of lungs, with chills, fever, sweats and emaciation.

**Gout.**—Restlessness; wakefulness; irritability; dyspepsia; scanty, high-colored urine; agonizing pain and tenderness in ball of great toe; toe reddish purple and glazed; veins enlarged; in chronic gout joints enlarged, deformed, chalky, stiff, may ulcerate.

**Gall Stone Colic.**—Passage of gall stones causes sudden, agonizing, cutting, tearing or shooting pain on the right side of abdomen, spreading to right side of chest and shoulder; muscles of abdomen cramped and tender; nausea; vomiting; profuse sweat; frequent urination; pale, distorted, anxious face; feeble pulses.

**Painter's Colic.**—Violent, painful contractions of the abdominal muscles; hollowing in of the abdomen; obstinate constipation; gripping, cutting pains; may be blue line around the gums.

**White Swelling.** *Tubercular Arthritis.*—Dull pain in joints, worse by motion or jarring; tenderness on pressure; more or less swelling and exudation of fluid; wasting of muscles above and below; skin white and shiny.

**Sciatica.**—Sharp, shooting pain running down the back of thigh; worse from motion; may be tingling and numbness, and nerves sensitive to touch; worse at night and in stormy weather.

**Stone in the Kidneys.**—Constant dull pain in the loin; on passage of stone, excruciating paroxysm of pain radiating into groin and bladder; numbness of thigh; nausea; vomiting; sweat; rapid pulse; sufferer may faint.



**Inflammation of the Testicles.** *Orchitis*.—Drawing, stretching pains from abdomen through spermatic cords and testicles; testicles swollen, sensitive, with soreness and tearing pains; drawing up of testicles, burning and difficulty in urinating.

**Writer's Cramp.**—Fatigue, weight or actual pain in muscles of hand; spasm of muscles when fingers grasp a pen; hand may tremble or neuralgic pain occur.

**Hip Joint Disease.**—Slight lameness; stiffness of muscles about the joint; progressive wasting of muscles of thigh; limping, with shortening of leg; more or less fluid in joint, and restriction of motion; formation of abscess, with pain and tenderness; deformity of hip.

## Poisoning.

**Arsenic Poisoning.**—Burning in stomach and bowels; cramps in abdomen and legs; vomiting followed by diarrhœa; rice-water stools which are bloody.

**Lead Poisoning.**—Obstinate constipation; abdominal colic; wrist drop; blue line about the gums; cramps in the legs; pains in the joints; trembling of extremities; intense headache; may be convulsions, delirium and lethargy.

## Skin.

**Eczema.** *Salt Rheum*.—Inflammation of skin, with watery pimples or pustules forming scales and crusts; itching; burning; watery or yellow sticky discharge, or oozing; raw surface beneath crusts; or dry, scaly patches, without itching.

**Itch.** *Scabies*.—Small pimples first appearing between fingers, in creases of wrists, groin, armpit, under the breasts, on inner side of thighs, with intense itching.

**Ringworm of the Scalp.**—Small, separate, round or irregularly shaped, reddened scaly patches, turning to little vesicles filled with matter, which dry up and scale off; hair dead and brittle; patches spread rapidly.

**Shingles.** *Herpes Zoster*.—Pin head to pea-sized watery pimples along a nerve, preceded, accompanied or followed by neuralgic pains in affected part; one side of body only; fluid dries up, and yellow-brown crusts form and drop off.

**Nettle Rash.** *Urticaria*.—Skin shows pale red elevations, itching intensely; finger drawn over surface causes white line which becomes elevated and red; eruption on covered parts of body especially.

**Boil.**—Small, limited, painful tumor beginning as a sore, itching pimple, developing a core of dead tissue, and suppurating.

**Carbuncle.**—Dark red, painful, circumscribed, flattened swelling, surrounded by dusky-red skin, appearing on neck, back or buttocks, suppurating in a week or ten days, and discharging through several openings.

**Cancer of the Skin.** *Epithelioma.*—In the beginning a few greasy scales or papery crust covering three or four shallow irregular ulcers with hard margin; or may be deep-seated, shiny, hard, red lump, changing to ulcer with blood-stained yellow fluid, or offensive sticky discharge; sharp, shooting pains.

**Blackheads.** *Acne.*—Small pimples on face, chest, shoulders, back, neck; moist or dry; reddish or black; with or without indigestion, debility, menstrual disorders; may contain matter or cheesy substance.

**Warts.**—Pinhead to bean-sized, limited elevation of the skin; some soft, red, dry or moist; bleed easily; some soft and pearly; others hard, black, flat or rounded.

**Gangrene.** *Mortification.*—In dry form, skin pale, dry, shriveled, semi-translucent, with bluish-mottled specks becoming dark, opaque, mummified; in moist form, congestion of part; skin dark, livid, moist; tissues soften and break down; foul odor.

**Ulcers.**—Sore on leg or elsewhere, red, inflamed, irritable, with painful, ragged edge; or varicose ulcer with much distention of nearby veins; or syphilitic ulcer with punched-out looking sore, and offensive discharge.

**Milk Crust.**—Small pimples form on face or scalp of infants and children, with redness and itching; pimples rupture and exude a sticky fluid forming yellow crust, with raw surface underneath.

**Scurvy.**—Great debility; bloodlessness; spongy, bleeding gums, with foul breath; teeth loosened; pain in legs; skin dry and rough; flesh brawny and hard; complexion shallow; bleeding from mouth, bladder, etc.; short breath; feeble pulse.

**Erysipelas.**—Slight fever, chilliness, tingling of affected part, which becomes glossy, bright red or brawny, swollen, hard, sharply defined; fever increases; pulse full, rapid; appetite lost; bowels constipated; tongue coated; small pimples form; inflammation spreads or begins to subside in four or five days.

### Swelling.

**Scrofula.**—Swelling and suppuration of glands of neck, groin and under the arms; sometimes slight fever, debility, emaciation; free perspiration, especially about the head.



**Goitre.**—Usually non-painful, non-tender swelling of varying size of thyroid gland in neck; when large, causing difficult breathing, headache, flushed face; may be shooting pains.

**Dropsy.**—Swelling of feet, hands, legs, abdomen or chest in lung, liver, kidney or heart disease; swelling and paleness of skin; surface hard and pitting on pressure of finger.

**Goitre, Exophthalmic.**—Debility and bloodlessness; enlargement of thyroid gland; protrusion and staring appearance of eyes; palpitation; pulse beats 100° to 140° a minute; blowing sound over gland.

### **Stomach.**

**Dyspepsia, Nervous.**—Tongue often clean, appetite very variable, may crave acids, slate pencils, etc.; headache; vertigo; irritability; depression; sleeplessness or bad dreams; lassitude; palpitation; lump in the chest.

**Dyspepsia, Catarrhal.**—Loss of appetite; sense of fullness and discomfort; eructations; nausea and sometimes vomiting; tongue heavily coated; mucus in vomitus and stools; may be diarrhœa; hiccup; heartburn.

**Bleeding from the Stomach.**—Usually occurs with vomiting and is provoked by taking food; blood is dark, clotted, and generally mixed with contents of stomach.

**Neuralgia of the Stomach.**—Intense, griping, agonizing pain in stomach usually extending to the back, with belching of gas, faintness, and intermittent pulse; symptoms partially relieved by pressure over stomach.

**Cancer of the Stomach.**—Indigestion; great acidity; flatulence; loss of appetite; foul breath; great debility; emaciation; vomiting; coffee-ground vomit from retained blood; pain, more or less continuous.

**Colic in Infants.**—Sudden paroxysms of spasmodic crying often waking child from sleep; jerking of the feet; clenching of the hands; sudden drawing up, then straightening of the legs; flatulence; distention or retraction of the abdomen; contortions of whole body.

### **Sores.**

**Syphilis. First Stage.**—Within a month of exposure, small, red sore appears on genitals, which enlarges and breaks in centre, leaving ulcer; nearby glands enlarge and become hard; may be no impairment of general health.

**Syphilis. Second Stage.**—Within six or eight weeks, sore throat; moderate fever; languor; headache; bone pains; indigestion; ulcers

on throat or tonsils; dull copper-hued eruption on abdomen, chest, arms, shoulders, genitals.

**Syphilis.** *Third Stage.*—Within one or many years, pustules on body which form deep ulcers, with dry crusts and scales; loathsome sores leaving bad scars; ulceration of throat, palate, nose; hard lumps in muscles and under skin.

**Abscess.**—Localized inflammation, with heat, swelling, pain, formation of pus, tendency to point and discharge matter.

## Throat.

**Tonsilitis.**—Tonsils swollen; difficulty in swallowing and much pain; often cheesy spots or patches on tonsils and throat; dribbling of saliva; fever; headache.

**Enlarged Tonsils.**—Tonsils too large; may contain minute cavities containing foul, cheesy matter; mouth breathing, difficult swallowing; snoring during sleep; mental dullness; night terrors; deafness; bad breath; thick voice.

**Quinsy.**—Tonsilitis symptoms, together with inflammation of deeper tissues; chills; high fever; swelling of glands of neck; supuration, and formation of tonsilar abscess, with tendency to point and discharge.

**Croup, Spasmodic.**—Hoarseness and slight cough during day; sudden awakening at night by severe paroxysm of suffocative, hard, barking cough; skin hot; pulse tense and rapid; perspiration.

**Pharyngitis.**—Soreness of back of mouth and throat; pain on swallowing or difficult swallowing; coating of glairy mucus on roof of mouth, tonsils and throat; some fever; swelling of affected parts.

**Diphtheria.**—Chills, moderate fever, sore throat, indisposition, followed by stiffness and swelling of glands of neck; grayish white membrane in throat, removal of which causes bleeding; weak pulse, scanty urine; detection of Klebs-Löffler bacillus.

**Thrush.**—Swollen, red, spongy gums; flaky, white deposits of lining membrane of mouth, leaving bleeding spots when removed; fever; pain in mouth; mouth waters; bad breath.

## Urine.

**Incontinence of Urine.** *Enuresis.*—Profuse involuntary flow of pale, watery urine; constant dribbling of urine while sitting or walking; dribbling of scanty, high colored urine; wetting the bed at night.



**Retention of Urine.** *Strangury*.—Urine passed drop by drop, with much urging and straining; pain and heat along the urethra; difficult, scanty urination.

**Stone in the Bladder.**—Irritation and inflammation of bladder; frequent burning discharge of small amounts of urine, with urging; acute pain on passage of stone, with bloody urine; sudden stoppage of stream of urine.

**Inflammation of the Bladder.** *Cystitis*.—May begin with chilliness and fever, then constant dull ache, or sharp agonizing pain in bladder; frequent urging to urinate, with burning pain on urinating; pus in the urine.

**Diabetes Mellitus.**—Gradual failure of health; frequent and excessive urination of pale urine, loaded with sugar; great thirst and emaciation; large appetite; constipation or exhausting diarrhœa; skin, mouth and throat dry; itching of skin; teeth decay; failure of sexual powers.

**Jaundice.**—Yellowishness of the skin, white of eyes, inside of mouth and of urine and feces; stools light colored; urine dark; may be itching of the skin; mental depression; delirium, convulsions, and stupor in bad cases.

**Inflammation of Urethra.** *Gonorrhea*.—Burning heat, tenderness and puffiness at entrance of urethra; catarrhal discharge, soon turning to thick, purulent matter; frequent, painful erections; urine passed in spurts, drops or twisted stream.

**Dropsy of the Abdomen.**—Sensation of weight in the abdomen; distention; difficult breathing; scanty urine; swelling of the feet; constipation; fluctuation of fluid on pressure.

## Worms.

**Worms.**—Loss of appetite or ravenous hunger; disturbed sleep; great restlessness; picking at the nose; bad breath; lassitude; dark circles round eyes, indigestion; straining at stool; itching of anus; grinding of teeth in sleep; may be colicky pains.

**Tape Worm.**—May be no symptoms, or may be indigestion; mucous stools; colicky pains; voracious appetite; debility; night terrors; intense itching of nose and genitals; twitching of muscles; convulsions.

# SKIN DISEASES



## SKIN DISEASES.

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THE skin is the soft and pliant membrane which covers the entire surface of the body. The interior, like the exterior is likewise covered by a skin, which, from its always being moist, is called a mucous membrane. At the various openings of the body, the outer and the inner skins are united, — forming one continuous skin, — like the same piece of silk turned over the border, and covering both the outside and inside of a bonnet.

From this continuity or oneness of the skin and mucous membrane springs an important medical law, namely, that a disease of the skin may spread to the mucous membrane, and a disease of the mucous membrane may spread to the skin. We see this illustrated by the breaking out around the lips which follow colds, and the itching of the nose of children when the mucous membrane of the bowel is irritated by worms.

**The Skin is Composed of Two Layers.**— These are separated from each other by the action of a blister. The thin portion which is raised up by the fluid of a blister is called the *scarf skin*, the *cuticle*, or the *epidermis*; that which remains in connection with the body is the *sensitive skin*, the *cutis*, the *derma*, or the *true skin*. The two skins have very different offices to perform. The scarf-skin is horny and insensible, and serves as a sheath to protect the more sensitive skin under it. Were the scarf-skin taken off, we could not bear to have anything touch us.

The *derma*, or *true skin*, and its glands, etc., are the seat of all the cutaneous diseases. These may be separated into four great divisions, — namely, diseases of the *true skin*, diseases of the *sweat glands and tubes*, diseases of the *oil glands and tubes*, and diseases of the *hairs and hair glands*.

Then the diseases of the true skin are divided into

*Inflammation of the true skin;*

*Enlargement of the papillæ of the true skin;*

*Disorders of the vessels of the true skin;*

*Disorders of the sensibility of the true skin;*

*Disorders of the color-producing function of the true skin.*

The inflammation of the true skin is conveniently divided into two groups, — namely,

Such as are marked by inflammation of the derma and mucous membranes, *with constitutional symptoms of a specific kind*, and

Such as are distinguished by inflammation of the derma, *without constitutional symptoms of a specific kind*.

### Congestive Inflammation of the True Skin.

**The First of these Groups**,—those characterized by inflammation of the cutis, *with constitutional symptoms of a specific kind*,—embraces *measles, scarlet fever, varioloid, and cow-pox*.

#### Measles. — *Rubeola*.

MEASLES is an acute inflammation of the entire skin, both external and internal, associated with an infectious and contagious fever.

**Symptoms.**—The disease sets in with chills, succeeded by burning heat, listlessness, languor, drowsiness; pains in the head, back, and limbs; frequent pulse; soreness of the throat; thirst, nausea, vomiting, frequent dry cough and high-colored urine. These symptoms increase in violence for four days. On the third day the eyes become inflamed, cannot bear the light, and pour forth a profusion of tears. This last symptom is called *coryza*. The nose likewise discharges a large quantity of watery secretion, and sneezing is frequent. The larynx, windpipe, and bronchial tubes become inflamed, and hoarseness, soreness of the breast, etc., are the result.

The redness of the skin and breaking out appear about the fourth day, and produce heat and itching. This breaking out is characterized by a patchy redness, which, on close inspection, is found to consist of numberless minute red points and pimples, collected into patches in the shape of a half or quarter moon. They appear first on the forehead and front of the neck, then upon the cheeks and around the nose and mouth. On the fifth day they reach their height in this region, and then appear upon the body and arms, and on the sixth day, upon the legs. The color of the skin, when the inflammation is at its height, is *of a bright raspberry red*. The decline of the rash takes place in the same order in which it comes out. The redness fades on the sixth day upon the face; on the seventh, upon the body and limbs; on the eighth, upon the back of the hands. The coryza, the hoarseness, and the cough, decline about the seventh day, while a diarrhoea comes on about the eighth or tenth, — showing that the inflammation of the mucous membrane is subsiding. When the inflammation disappears, the whole scarf-skin peels off in the form of a scaly scurf. The artist has given a good picture of the disease in the beautifully colored lithograph, PLATE I, Fig. 1.

**Treatment.**—When the disease is mild and regular in its course, scarcely anything will be required, except mild diet, slightly acid drinks, with flax-seed tea, slippery elm, or some equivalent, to quiet the cough. Sponging with tepid water, if done with frequency, moderates the fever, and adds to the comfort of the patient. If the fever





Fig. 1.



Fig. 2.

MEASLES

SCARLET FEVER





The cold stage having passed, and the fever set in, warm water may be used without the mustard, etc. If the head be affected, put mustard drafts upon the feet. Should the bowels be costive, they may be gently opened by some very mild physic.

No solid food should be allowed; but after the first shock of the disease is passed, drinks, in reasonable quantities, will be advisable,—such as cold water, lemonade, barberry and tamarind water, rice water, balm or flax-seed tea, and some thin water-gruel.

To promote the action of the skin, the spirits of nitre, with other articles (125), adapting the dose to a child, will be found useful.

Muriatic acid, forty-five drops in a tumbler filled with water, and sweetened, and given to a child in teaspoonful doses, is a good remedy.

In very violent attacks, the system sometimes inclines to sink immediately; typhoid symptoms show themselves; there is great prostration; the eruption strikes in; the skin changes to a purple or mahogany color; the tongue is of a deep red, or has a dark-brown fur upon it, and the ulcers in the throat become putrid. This is called scarlatina maligna; but it is only a severer form of the same disease.

The treatment of this form must be different from that recommended above. It must be *tonic*. Quinia (65) must be freely given. Wine whey, mixed with toast-water, will be useful. Tincture of cayenne, in sweetened water, may be given often in small doses. Ammonia (135) may likewise be given as a stimulus. Gargles (245) (244) (243) are also required.

A dropsical affection is one of the most frequent results of scarlet fever. It is believed that this seldom occurs, if the warm bath is daily used, as soon as the skin begins to peel off. After the dropsy has set in, give the warm bath twice a week, and encourage perspiration by the compound tincture of Virginia snake-root, and similar articles.

In young children, also in severe cases of fever or where the kidneys are not working properly as shown by swelling of the face, abdomen and extremities, milk should be the only article of diet allowed until these symptoms have quieted down. Should the stomach reject the milk, you may add lime water, a teaspoonful to a tumbler of milk. From one pint to two quarts of milk according to age will maintain the nourishment of anyone over days and weeks at a time and gradually the different broths, as chicken or lamb and beef tea, may be added, and later bread and butter, boiled custard, rice and tapioca puddings.

Anointing the skin with vaseline at night and washing off in the morning with suds removes the poisonous scales, and lessens the danger of contagion, as well as improves the activity of the skin. Nasal and aural catarrhal diseases are commonly observed to follow scarlet fever and need attention of a physician. Rheumatism likewise is a frequent sequela, while nephritis or inflammation of the kidneys is often a sad reminder of the disease. These two complications are to be treated as directed elsewhere.

TABLE EXHIBITING THE DIFFERENCE BETWEEN SMALL-POX, VARIOLOID, SCARLET FEVER AND MEASLES.

SMALL-POX.	VARIOLOID.
<i>First.</i> Period between exposure and when disease first shows itself is from five to twenty days — usually shows itself in ten or twelve days.	<i>First.</i> Period of incubation more irregular than Small-Pox — from five to twenty days — averages twelve days.
<i>Second.</i> The fever and temperature is high, but is less after rash appears.	<i>Second.</i> Fever high till rash is well developed and then a greater improvement than in Small-Pox.
<i>Third.</i> The rash appears on third or fourth day and is seen on the forehead or some part of face.	<i>Third.</i> Eruption appears on third or fourth day.
<i>Fourth.</i> The eruption first consists of pimples, then watery blisters which become white and sink in the center.	<i>Fourth.</i> Rash consists of pimples, may go on to pustules and blisters, but usually subside before advancing so far.
<i>Fifth.</i> The tongue is coated and swollen.	<i>Fifth.</i> Tongue coated and swollen.
<i>Sixth.</i> The eyes do not run, and bronchitis does not appear.	<i>Sixth.</i> No nose or eye symptoms as a rule.
<i>Seventh.</i> Sore throat is often present but not to as great an extent as in Scarlet Fever. Delirium and convulsions may occur.	<i>Seventh.</i> Sore throat mild. Delirium and severity of disease often marked at beginning but quickly subside.
<i>Eighth.</i> Secondary fever appears after several days.	<i>Eighth.</i> Secondary fever less marked than in Small-Pox.
<i>Ninth.</i> There are apt to be pocks and the eyesight be weakened, but by modern treatment it can usually be avoided.	<i>Ninth.</i> Instead of rapidly convalescing, the patient often shows an amount of weakness and anæmia all out of proportion to preceding symptoms.
SCARLET FEVER.	MEASLES.
<i>First.</i> Period between contagion and when disease first shows itself is usually from three to six days, but may be much longer.	<i>First.</i> Period between exposure and when disease first shows itself is from seven to fifteen days.
<i>Second.</i> Fever greatly increased and continues without abatement after eruption appears.	<i>Second.</i> There is a moderate fever. It does not decrease but increases after eruption.
<i>Third.</i> Eruption makes its appearance on second day on the chest and neck and spreads over the body during the next twelve hours.	<i>Third.</i> Eruption appears on fourth day on face and spreads over rest of body in about two days.
<i>Fourth.</i> The eruption extends over the entire skin.	<i>Fourth.</i> Eruption is crescent-shaped, rest of skin healthy.
<i>Fifth.</i> Eruption lasts from six to seven days when it begins to come off in large scales.	<i>Fifth.</i> Eruption lasts about five days, then peels off in scales.
<i>Sixth.</i> Tongue is covered with little red points.	<i>Sixth.</i> Tongue has red edges and is coated.
<i>Seventh.</i> There is little trouble with bronchitis or running of eyes.	<i>Seventh.</i> The nose and eyes run and bronchitis is usually apparent.
<i>Eighth.</i> Sore throat.	<i>Eighth.</i> Usually throat is not sore.
<i>Ninth.</i> The mind is apt to be affected and there may be delirium.	<i>Ninth.</i> The mind is not affected.
<i>Tenth.</i> Usually no secondary fever.	<i>Tenth.</i> The fever subsides after the third day and there is no secondary fever.
<i>Eleventh.</i> In Scarlet Fever there is great danger of the patient being left with kidney trouble, or the eyes, ears, or throat may be affected.	<i>Eleventh.</i> The patient's eyes may be inflamed and consumption or bronchitis follow.

### Small-Pox. — Variola.

THIS is another disease characterized by acute inflammation of the entire skin, both external and internal, connected with infectious and contagious fever. The eruption has the form of red points, which soon become pimples, then vesicles, then flattened and scooped-out vesicles, then pustules, and finally hard brown scabs. These last fall off from the eleventh to the twenty-fifth day, and leave behind them small pits and scars. The fever is remittent, and precedes the eruption some three or four days, — ceasing when the eruption is developed, and returning when it has reached its height. The period between exposure and the attack of the disease, called *incubation*, is from five or six to twenty days, — being short in the severe cases, and longer in the milder ones.

**Symptoms.** — The disease begins with languor and lassitude, with shivering, and pains in the head and loins; with hot skin, and quickened pulse and breathing; with thirst, loss of appetite, and furred tongue; with nausea, vomiting, constipation, restlessness, and uni-



versal prostration. To these symptoms sometimes succeed difficult breathing, cough, drowsiness, and even insensibility. The tongue, white at first, soon becomes red at the point, and over the whole surface. The fever is highest during the night. The constitutional symptoms are more violent just before the eruption, but immediately subside, and soon disappear, when the breaking out is established. The eruption is at first in the shape of small red points, which are *hard* to the touch, and shaped like a cone, and are proportionate in number to the subsequent pustules. In PLATE II the artist has well exhibited the developed disease, as well as the progress of the eruption from day to day.

**Treatment.** — Like the two preceding diseases, the ordinary, uncomplicated form of this requires only the most simple treatment. Not much is wanted, except confinement in bed, cooling drinks, cool and even temperature, frequent change of linen, and sponging the body with cool water. But when what is called the fever of invasion is past, and the eruption is *fully developed*, and has brought along with it the *secondary fever*, then some recipe, as (131), (355), (125) will be in place, and some gentle laxative to keep the bowels open (8), — also gentle injections (249), and opiates to relieve sleeplessness and nervous symptoms; (356) (357) may be used if very sleepless.

Should the system, at this period, appear to be sinking, a more generous diet, and a little wine may be allowed. If the brain suffers, apply cold ice-cloths to head, or an ice-bag behind the ears, and put the feet in a mustard bath (242). If the breaking out appears with difficulty, put the patient into a warm bath, and give extract of jaborandi (358). Gargles will frequently be needed for the inflammation, and dryness of the mouth and throat (243). Cold sponging may be considered as highly beneficial, in both the primary and secondary fever. The belladonna likewise is a useful remedy, used in the same way as in scarlet fever. The plaster (288), applied to the face, will, it is said, arrest the formation of matter, and prevent the unsightly scars which so often cover the face of persons who have suffered from small-pox. Paint the face once or twice a day with glycerine, which will effectually prevent pitting. The use of flexible collodion is better.

**To avoid Pitting,** and the occurrence of unsightly scars of the face, several methods of dressing have been used. The simplest consists in covering in the vesicle with iodoform-collodion, say, twenty grains of the former to one ounce of the latter. Having pricked the vesicle with an absolutely clean needle, one, for instance, that has been boiled in soda-water for five minutes, a layer of this collodion should be applied and allowed to dry on at once. Should pus form under this coating it must be released by washing off the collodion with alcohol. The wound is then to be thoroughly disin-

fectured with carbolic acid water (one teaspoonful to pint of water) and the collodion again applied.

This process will avoid most of the pitting.

### **Varioloid.**—*Mild Small-Pox.*

VARIOLOID, or modified small-pox, begins with symptoms similar to those of small-pox, but much milder in degree. These symptoms are feverishness, nausea, vomiting, pains in the loins and head, and a quickened pulse. The eruption comes out on the third or fourth day, and looks like that of small-pox. It reaches its height the fourth or fifth day, and then declines without any secondary fever. The pustules dry up and form brown scabs which fall off in a few days, and leave slight pits, and a few red or purple spots.

### **Chicken Pox.**—*Varicella.*

CHICKEN-POX is a contagious disease, associated with mild fever and a blister-like eruption called blebs over the body.

**Symptoms.**—The disease appears usually from two to three weeks after exposure of the child to some one else similarly affected. At first a mild fever and feeling of tiredness causes the patient to stay indoors, though intense pain in the head, back and legs with high temperature, vomiting and even delirium are not uncommon.

The eruption usually appears in one to three days and are small, watery blisters averaging one-eighth of an inch in size. They are more numerous over the chest and trunk, occasionally over the face and forehead and even in the roof of the mouth. They do not have the so-called shotty feeling when pressed to the bursting point under the finger as in smallpox, neither is the red blush around them so marked.

Unless scratched by the finger nails or a very severe case, very few scars will remain.

**Treatment.**—The treatment is practically a mild diet for a few days, keeping the patient indoors to avoid exposure to cold or wet and some simple medicine as sweet spirits of nitre in dose of half a teaspoonful in water every three hours to allay fever and keep the kidneys working properly.

### **Cow-Pox.** — *Vaccina.*

THIS disease exists to some extent among lower animals, and is identical with small-pox in man. The immortal Jenner taught the world that the pus taken from the cow having this disease, and introduced under the skin of man, would produce an eruption similar to that of small-pox, and that this would protect the system from the latter disease. This was an immensely important discovery, and will render the name of Jenner famous through all time.

Before this discovery smallpox killed in England as many persons



ERYSIPELAS

Pl. 3



Fig. 1

INFLAMMATORY BLUSH



Fig. 2





as all other diseases combined. To-day, if a person has even been vaccinated once in their life the chance of death is only thirty out of one hundred, while if never vaccinated about sixty per cent. die. If vaccinated and the "scar" is plain, not over eight per cent. die.

It is usually a wise precaution to be revaccinated once in eight years, especially if an epidemic of smallpox appears.

**The Second Group** of diseases, characterized by inflammation of the true skin, *without constitutional symptoms of a specific kind*, are Erysipelas, Nettle-Rash, False-Measles, and Inflammatory Blush.

### **Erysipelas.** — *St. Anthony's Fire.*

ERYSIPELAS is a diffused inflammation of the skin, affecting only a part of the surface of the body, and is accompanied by a fever, which is generally thought to be infectious and contagious. The local inflammation is disposed to spread; it extends deep, and is attended by swelling, a tingling, burning, and pungent heat, and by a redness, which disappears when the skin is pressed by the finger, and returns on remitting the pressure.

**Symptoms.** — The constitutional symptoms are chilliness and shaking, succeeded by heat; lowness of spirits, lassitude, pains in the back and limbs, pains in the head, quick and hard pulse, thirst, loss of appetite, white and coated tongue, bitterness of mouth, nausea, vomiting, pain in stomach, and costiveness.

These symptoms go before the local inflammation several days; they increase with the redness of the skin, and disappear upon its decline. The nervous system is sometimes severely affected, and indicated by low, muttering delirium. At the close of the inflammation there is generally a relaxation of the bowels, and the scarf-skin peels off. Sometimes matter forms under the skin, and occasionally mortification occurs. The face is the most frequent seat of the disease. It commonly begins on one side of the nose, and soon spreads over one side of the face, closing up the eye, and changing the features in a shocking manner. See PLATE III, Fig. 1.

Somewhere about the third, fourth, or fifth day, very minute blisters appear on the inflamed parts, filled with water, which increases until the blisters break and let it out. The disease comes to a head on the eighth or ninth day, when the blistered parts dry, and the skin begins to peel off.

**Treatment.** — In the treatment two things are to be done, — to subdue the fever, and the local inflammation. The fever is assuaged by rest, mild diet, gentle laxatives (26), (21), (125); and by the use of tincture of veratrum. For the local inflammation, various things have been advised, but nitrate of silver, on the whole, has the preference. First wash the inflamed part with soap and water to remove any oily substance, and wipe the skin dry. A solution of nitrate of silver will in many cases, according to Dr. Higginbottom,

do even better. Use a solution of 80 grains of silver nitrate to half an ounce of water that has been boiled and then cooled. Apply with a camel's hair brush over the entire inflamed area and for a small space beyond.

Apply two or three times to secure a firm coating but use carefully to avoid sloughing. A perhaps better remedy than any is to apply after washing with water and castile soap, a thick coating of ichthyol with vaseline equal parts. Cover this application with oil paper or absorbent cotton as it will stain the clothes.

In mild cases, flour may be dusted on the inflamed part from the dredging-box. Warm fomentations are also useful, and cloths wet with water, and laid on. A solution of perchloride of iron, applied to the inflamed skin, is much used now, or water as hot as can be borne.

In erysipelas the powers of the system are generally reduced, and tonics, such as quinine, wine, etc., are generally required. Dr. Robert Williams, — high authority in these matters, — says he puts his patients upon milk diet, gently opens the bowels, and gives them, daily, from four to six ounces of port wine, together with sago, and that he seldom has to change this course, whatever the symptoms.

For the inflamed skin, a tea made of buckwheat meal is a good wash. Alcohol and water, or new rum, may be used for the same purpose.

### Nettle-Rash. — *Urticaria.*

NETTLE-RASH begins with fever, which lasts two or three days, when wheals of various shapes, round, oval, and oblong, appear in the midst of red, slightly elevated patches, attended by great itching and tingling, as if the common nettle had been applied to the skin. The wheals go off during the day, and come again at night. The eruption is often a symptom of other diseases, or of mental anxiety. Sometimes it is the effect of articles of diet. Children have it occasionally while cutting teeth. A lighter form of the disease exists, in which the wheals appear and disappear at short intervals, according to the heat of the weather, the exercise, diet, etc.

**Treatment.**— The treatment varies according to the cause of the disease. If this be anything offending the stomach, especially if it be putrid fish, an emetic (2), (4) will be required, followed by brisk physic (359). After which take a few doses of quinine (75). For external application, the lotion (216) or common vinegar and water (215) will be useful. Dr. Wilson recommends corrosive sublimate, etc. (217), as the best lotion to apply outwardly. Soda bath better.

The diet should be simple and cooling, all stimulating food and condiments being avoided. Fruit, candies, and berries often the cause.



### Rose-Rash.—*Roseola*. — *False Measles*.

**Symptoms.**— The summer rose-rash appears first on the arms, face, and neck, thence it spreads over the whole body, producing tingling and itching. It is usually preceded by the symptoms of fever-chills, succeeded by flushes of heat, languor, pains in the head, back, and limbs, restlessness, quick pulse, and thirst. The rash appears in small irregular patches, paler than those of measles, and of a more roseate hue. There is some hoarseness from inflammation of the throat. The rash never continues more than five days, unless it be merely partial, in which case it sometimes comes and goes at intervals for weeks. If it “strike in,” it generally produces disturbance of the stomach, headache, and faintness, which are relieved by its re-appearance.

The autumnal rose rash is in more distinct patches than the former, of a circular figure, slightly elevated, and of a dark damask-rose hue. Seldom any fever, or itching and tingling.

**Treatment.**— For the first-described form of the disease, light diet, acid drinks, and gentle laxatives; for the second, recipe 59 or 51, according to convenience.

### Inflammatory Blush. — *Erythema*.

WHAT is called marginated inflammatory blush, is a mottled, red, smooth fullness of the skin, occurring on the extremities and loins, in irregular patches, bounded on one side by a hard, elevated, red border. This species of disease attacks old people, and indicates some internal disorder, which is dangerous.

Another form of the complaint appears on the arms, neck, and breast, in extensive, bright-red, irregular patches, slightly elevated. The redness, at its height, is very vivid, and continues about a fortnight, when it assumes a purplish hue in the centre.

**Treatment.**— Light diet, gentle purgatives (21), soda bath to allay the tingling and secure sleep, and the mineral acids (63), with bitter tonics, comprise all that is required, except sponging with water, and friction.

### Watery Pimples.

WE now come to a class of diseases characterized by watery pimples. Wilson says they are distinguished by “effusive inflammation of the derma,” which means that there is inflammation of the true skin, which causes water to be poured out on top of the derma, and underneath the scarf-skin, causing the latter to be lifted up in the form of small or large blisters, or vesicles. At first the fluid in these pimples is transparent, but in a short time becomes milky. Sometimes this fluid absorbs; at other times, it dries up, and with the cuticle scales off as scurf.

## Eczema and Salt Rheum.

**ECZEMA** is an inflammatory, acute or chronic, non-contagious skin disease characterized at first by redness, little pimples, vesicles or pustules and is attended by more or less burning itching. This process terminates either in the formation of crusts as the result of dried sticky serum, or else in the formation of fine scales.

No skin disease has such a variety of aspects nor such grades of inflammation. There is generally more or less oozing of the blood-serum, which dries and thickens, forming crusts. There is usually more or less thickening of the skin, making it like leather; there is generally some considerable scaling.

Eczema may subside in a few weeks never to return, or, what is more probable, may lapse into a chronic state and continue for months and years, with bothersome symptoms, which are extremely annoying.

**Salt Rheum** is a chronic eczema of this last variety.

**Treatment.**—In the acute stage of eczema, soothing lotions, powders, or ointments should be used, such as 372, 373, 374. Some are better treated with powders, some by lotions; the itching and heat are best relieved by 373.

In the more chronic variety some stimulating ointments are needed, like 375. Carbolic acid, 10 or 15 grains to the ounce of oleate of zinc ointment, is an admirable remedy for the itching and burning. Salicylic acid, 10 grains to the ounce of benzoated zinc ointment is likewise very serviceable, while tarry preparations generally are the most satisfactory in this chronic stage.

No skin disease, however, is often so stubborn to treatment as the different forms of eczema. The cure often will be slow and medicines frequently changed. The local varieties of eczema require special treatment.

**Eczema of Head in Children.**—After oiling freely the crusts over night and washing off with suds in the morning, apply Salicylic acid, 1 part, tincture benzoin, 2 parts, vaseline, 50 parts. The very chronic, thick, and indurated skins require 360, and in many cases 219, especially the chronic hand-cracks. The diet must be free from irritating articles of food, the bowels regulated and the hygiene of the skin attended to, while tonics and general systemic measures are often called for.

## Tetter — Shingles.— *Herpes.*

AFTER a slight feverish attack, lasting two or three days, clusters of small, transparent pimples, filled sometimes with a colorless, sometimes with a brownish lymph, appear on the cheeks or forehead, or on the extremities, — and at times on the body. The pimples are a little larger than in eczema, — about the size of a pea. After a few



days the vesicles break, pour out their fluid, and form brown or yellow crusts, which fall off about the tenth day, leaving the surface red and irritable. The eruption is attended with heat, itching, tingling, fever and restlessness, especially at night. Ringworm is a curious form of herpes, in which the inflamed patches assume the form of a ring. Shingles usually attack the aged about the ribs of one side, and are evidences of impaired health and nutrition. They are very prostrating and require tonics from the start.

**Treatment.**— Light diet, gentle laxatives. If the patient be advanced in life, and feeble, a tonic (75) will be desirable. For external application, belladonna (173), or an ointment of sulphuret of lime, (174), or elder-flower ointment, etc. (175). Equal parts of chloral and camphor applied several times a day, especially later in the disease (361), give most relief.

### Itch.— *Scabies*.

To this disease all classes are liable, though it is much less common than in former years. It is found frequently among the poor, whose condition in life does not give them the means to guard at all points against it; but it is most common among such as neglect personal cleanliness.

**Symptoms.**— An eruption of distinct, cone-like, watery pimples, which are transparent at the summits, and are accompanied by an excessive itching, which is made worse by high-seasoned food, by drinking liquor, and by the heat of the bed. When these pimples are scratched and torn, a sticky, watery fluid is poured out, which forms small scabs; and, in time, if the disease is not cured, these scabs being torn off, extensive sores are made.

**Cause.**— It will excite the wonder of many readers to state that animals of so small a size as scarcely to be seen with the naked eye exist in the skin of man. Yet such is the fact; and it is the presence of these minute creatures, or the effect of their presence, which constitutes the disease called itch. The little creature (*acarus scabiei*, by name), a species of *mite*, is one seventy-seventh part of an inch in length; and when closely inspected under the microscope, is really a beautiful, I may say an elegant, animal. Here are a front, a side, and a back view of him, well done by the artist.

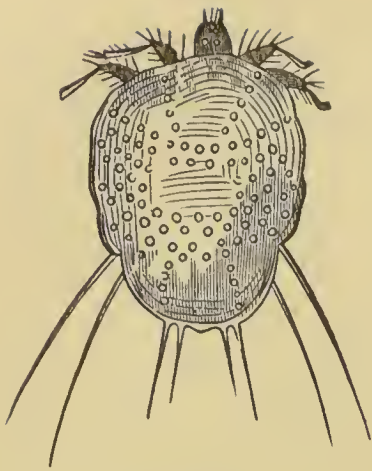


FIG. 73.

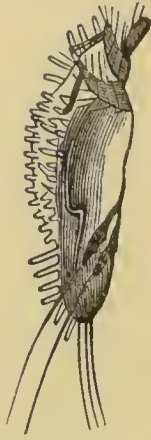


FIG. 74.

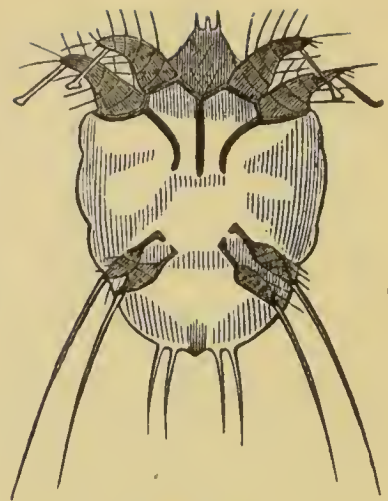


FIG. 75.

**His Method of Attack.**— When placed upon the skin, the little fellow, like the squirrel and other ground-animals, sets himself to make a hole through the scarf-skin with his head and fore feet. Into this he pushes his whole body. He then begins to burrow himself in the derma or true skin — making a channel many times his own length, at the end excavating a chamber where he sleeps, and whence he goes out to do his day's work at mining, or boring for food. When tired of this sleeping apartment, he digs onward and scoops out another.

This travelling, and boring, and turning about in an organ as sensitive as the true skin, must, of course, occasion a tickling and *itching*; and from this circumstance the disease took its name of *itch*. But this itching is not painful. James the First is said to have remarked that the itch was fitted only for kings — so exquisite is the enjoyment of scratching. Probably it is a royal luxury. Be that as it may, most persons would consent to have it all done by royal fingers. They have been used for meaner purposes.

**Treatment.**— Whatever will kill the little animal described above, will cure the itch. Various agents have been employed for this purpose, but none have been found equal to sulphur. The compound sulphur ointment is a sovereign remedy for the disease. Four ounces of this should be well rubbed into the skin, before the fire, morning and evening, for three or four days. This will put an end to the whole colony of these sovereign squatters upon forbidden soil.

Two ounces of sulphuret of potash, and the same amount of soft-soap, dissolved in a pint of water, and applied well to the skin, is used in many cases with good effect.

Caustic potash, one part to twelve parts of water, applied in a similar way, is said to be a pretty sure remedy.

A solution of the chloride of lime, used as a wash, will often effect a cure.

The ointment of the American hellebore sometimes does well.

Before applying any of these preparations, let the skin be washed with warm water and soap, and well dried. Be sure the parasite is



killed before ceasing treatment. Best to continue few days longer than what is apparently needed.

### Rupia.

THIS is from a Greek word which means dirt, from the dirt-colored crusts which are formed after the breaking of the large watery pimples. The vesicles are like those of eczema and herpes, except that they are *larger*. This is distinguished from all other skin diseases by the formation of unhealthy, foul, and burrowing sores, which pour out a reddish matter in such quantities that it collects and dries upon the sore, and forms a crust of great thickness, — sometimes of the size of an oyster-shell. Rupia has its origin in a weakly and debilitated constitution, and cannot be cured without renovating the whole system. It is a manifestation either of syphilis or lupus.

**Treatment.**— Warm baths once or twice a week, with generous and nutritious diet. Tonic medicines (63) (51) (67) (61) (65) will be required. For external treatment, dust the surface of the ulcers with cream of tartar, or apply nitrate of silver (214) (219) (220), white vitrol, etc. See syphilis.

### Pemphigus. — Pompholix.

THE first of these terms is from the Greek, and means a *bubble*; the second, pompholix, is from the same language, and means a *water-bubble*. This is still more applicable to the disease in hand, which consists, in fact, in the raising up of the scarf-skin in the shape of bubbles, containing a watery fluid. These bubbles are just like common blisters. They vary from the size of a split pea to that of a hen's egg. They rise up very rapidly, and break in two or three days, leaving a raw surface which soon becomes covered by a thin crust.

**Treatment.**— Similar to that for Rupia, with the addition of iodide of potassium (140), and applying the stick nitrate of silver to the whole surface of the ulcer, and a short distance beyond it on all sides, or the ointment (176). See treatment for syphilis.

### Mattery Pimples.

ANOTHER natural group of skin diseases are distinguished by an eruption of pimples, filled, not with water, like those just described, but with matter. The pimples of this class are not transparent, or whitish, but *opaque* and *yellow* from the first. The matter is poured out upon the true skin, and raises up the scarf-skin, in the same way as the watery pimples. As in the preceding diseases, too, the drying up of the matter forms crusts. But these pimples are never so small as those of eczema, nor so large as those of pemphigus.

### Crusted Tetters. — *Impetigo*.

THIS eruption consists at first of slightly-elevated pustules or pimples, closely congregated, with an inflamed border. These break, and the surface becomes red, excoriated, shining and full of pores, through which a thin, unhealthy fluid is poured out, which gradually hardens into dark, yellowish-green scabs. These scabs sometimes look like a dab of honey dried upon the skin. This has given impetigo the name of "honey disease," or honey scab. This honeyed look is well represented in the crusts which form on the lips and ears of children. Sometimes these scabs cover nearly the whole face, and are called the milk crust. This is putting the agreeable words *milk* and *honey* to rather questionable uses! When this crusted tetters invades the head or scalp, it causes the hair to fall, and becomes what is called a *scall*. Impetigo may be simple, or contagious, or syphilitic.

**Treatment.**— The vapor bath, and water dressing. The following ointments are useful: oxide of zinc, white precipitate, or diluted nitrate of mercury (178). Hydrocyanic acid (221), applied externally, has a fine effect. The crusts should first be removed by a weak lye made from hard-wood ashes, or potash; then, after applying one of the ointments above, or the lotion, cover the part with oil-skin. If the crusts are on the head, the hair should be cropped off before the remedies are applied. When of syphilitic origin, treat as for that disease.

### Papulous Scall. — *Ecthyma*.

THE mattery pimple called ecthyma is developed on a highly inflamed skin. The bladders are about the size of a split pea, and are surrounded by a broad ring of redness. They are generally separate, not clustered like impetigo. They are scattered over various parts of the body, and are followed either by a hard black crust, or by a sore. The disease is either acute or chronic. The latter attacks weakly children, and persons reduced by sickness or low living.

**Treatment.**— For the acute form, give a generous diet, with ointment (176), and the cold sponge-bath on the sound parts. Use (176) (175) (214) (211) for external application. Hygienic treatment, tonics, and stimulants are called for; iron, quinine, arsenic, and nux vomica.

### Scaly Eruptions.

THE scaly eruption is called a dry tetters. It is an inflammation of the true skin, and is distinguished from the rashes and pimples by the alteration of the scarf-skin. The diseases forming this group are three in number,—*lepra*, *psoriasis*, and *pityriasis*.



### Leprosy. — *Lepra*.

IN this disease, the eruption makes its appearance as a small, salmon-red spot, raised a little above the surrounding skin, and constituting, in fact, a flat pimple, almost as large at the top as at the bottom. On top of this pimple the scarf-skin becomes rough, and after a little while a thin scale is produced. New layers are added to its under surface, and it accordingly grows thicker. It has a bright, silvery lustre. These scaly spots multiply, and become the form of leprosy called *lepra guttata*, from the Latin *gutta*, a drop, the scales looking like drops of water on the skin.

But the eruption more frequently spreads out into circular patches, of the size of a fifty-cent piece. These generally appear below the elbows and knees, and on the breast and shoulders, and back of the hands. Sometimes the entire hand is covered with scales of a peculiar silvery whiteness. These patches heal from the centre.

### Psoriasis.

THIS differs from lepra in the eruption being more irregular. The spots sometimes come out in thick clusters, and blend in various ways. Instead of appearing in distinct circular forms, as in leprosy, the patches are irregular, and of every size. Instead of one well-formed and thick scale, there are many small and thin ones. And instead of a depressed centre with rising edges, the surface is level. While leprosy is a circular dry tetter, this is an irregular dry tetter.

**Treatment.**—Pyrogallic acid in ointment, 10 to 40 gr. to oz. Apply daily; it discolors the skin for a while. Chrysophanic acid in same strength is the best remedy known. It also discolors the skin and inflames the neighboring skin for a while. Recently the thyroid gland of the sheep has been used in five-grain tablets three times daily as an internal medicine with much success.

### Pityriasis.

THIS is much like the two preceding, except that it gives rise to a copious production of very small bran-like scales. Indeed, its name is from the Greek, and means chaff or bran. It is a branny tetter. It may occur on any part of the body.

**Treatment.**—When the skin is highly inflamed and stiff with heat, pain, and itching, the diet should be light, and the drinks of a cooling and unexciting kind. The warm bath and gentle friction of the skin are useful. Laxatives or tonics may be employed, according to the indications,—frequently laxatives first, and tonics afterwards. The specific remedies for curing the disease are unknown; iodide of potassium (140), arseniate of iron (68), Fowler's solution, in two-drop doses, three times a day; or Donovan's solution, in five-drop doses,

three times a day. For external application, use a naphthaline ointment (177), zinc ointment, white precipitate ointment, diluted nitrate of mercury ointment, or solution of corrosive sublimate (212).

### Dry Pimples.

THESE are distinguished by the high degree of irritation of the skin which they create. They are exceedingly troublesome, not only from the distress and itching they occasion, but because they are likely, in consequence of this, to be torn into painful and obstinate sores.

When appearing in children, they are called *red gum*, and *tooth-rash*. In grown persons, one form is named *lichen*, and another, distinguished by excessive itching, *prurigo*.

In this form of pimples, the fluid is not poured out upon the *surface* of the true skin, — as in several of the preceding diseases, — but is collected within the tissue of this organ, and the pimples feel hard under the finger.

The tooth-rash of infants is always accompanied with some feverishness, caused generally by irritation of the gums from growing teeth, occasionally by flannel worn next the skin.

**Lichen** has a variety of forms. In one case the pimples are of a bright red, in another, bluish or livid. In one case they appear in circular groups, in another they produce great disorganization of the skin, and occasion terrible suffering.

**Prurigo** is a still more cruel disease than lichen. The pimples are not very manifest, but the skin is thickened or swollen, and condensed. The suffering from it is terrible. It gives one no sleep, night or day. That form of it called ant-bite prurigo gives the sensation of millions of ants eating the flesh, or as many red-hot needles piercing it. This renders the existence of many elderly persons a terrible burden.

**Treatment.**—Careful diet, and gentle aperients and tonics, according to the condition of the system. Externally, the cold salt-water sponge-bath, and glycerine, vinegar and water, applied with a soft sponge. Tar and sulphur are among the more successful remedies in fighting this rebellious disease (362). Iron, quinine, cod-liver oil. For relieving the terrible itching of the private parts, which females sometimes suffer, I have found morphine (223), for external use, very effectual.

### Lupus.

THIS makes its appearance in the form of one or more circular elevations, of a dull red or salmon-color, and partially transparent. When pressed under the finger, these elevations are found to be soft,



and when the finger is removed, they are flat and whitened. They generally appear on the face, and particularly the nose.

In another and worse form of the disease, the tubercles are harder; and after a time, they become covered with thin brown scabs, which are scratched off, and followed by others, and these by others, until ulcers appear, which are sometimes slow and sometimes rapid in their progress. The whole nose has been destroyed by them in a month. (See Fig. 76.) This is one of the diseases which Erasmus Wilson thinks, and, in my judgment, correctly, to be, like scrofula, the result of tubercular poison, filtered through the blood of several generations. It is a disease which is the most destructive in the shortest time of all diseases.



FIG. 76.

**Treatment.**— The internal remedies are iodide of arsenic (141), and iodide of potassium (140); the external, vinegar of Spanish flies; and to promote the healing of the ulcers, a weak solution of nitrate of silver (211) (214) is adapted.

Hardly any disease has been treated by so many different remedies. At present the prospect of a cure is good, as certain anti-tubercular lymph injections have been found effective; but no time should be lost in immediately consulting a surgeon, as its growth can be arrested, and the disease may be exterminated by early treatment.

### **Warts and Corns.**— *Verruca* — *Tylosis* — *Clovus*.

IN the derma or true-skin there are a great many small arteries, veins, and nerves, united together, and formed into loops (see Fig. 43), resembling, in shape, the peaks of miniature mountains. These are called *papillæ*. These loops, frequently, without any apparent cause, take on a disposition to grow, and by extending themselves upward, they carry the scarf-skin along with them, which is thickened; and together they form what is called *warts*. Corns are formed by a somewhat similar growth of the *papillæ*, brought about by the pressure and friction of tight boots and shoes.

**Treatment.**— For warts, take a piece of diachylon plaster, cut a hole in the centre the size of the wart, and stick it on, the wart projecting through. Then touch it daily with aqua fortis. Nitrate of silver sometimes answers well for touching it. They may be taken off very neatly, sometimes, by tying a string tight around them. Corns should be shaved down close, after being soaked in warm

water and soap, and then covered with a piece of wash-leather, or buckskin, on which lead plaster is spread, a hole being cut in the leather the size of the corn. They may be softened, so as to be easily scooped out, by rubbing glycerine on them. Manganic acid destroys warts and corns rapidly. Bunions, which affect the joint of the great toe, must be treated with fomentations, and sugar of lead water (224), when there is considerable inflammation, with rest in a horizontal position. But the best cure for corns and bunions is to put away tight shoes. Wear a bunion-plaster for some time to take the pressure off of the corn or bunion.

### **Mother's Marks.—*Naevus.***

THE small vessels of the skin, called capillaries, suffer certain alterations of structure which pass under the name of mother's marks. These marks are simply a great dilatation of these minute blood-vessels. They vary in size from a mere point to a patch of several inches square.

The smallest of all is the *spider mark*. It is a small red point, from which several little straggling vessels spread out on all sides. Sometimes this is of the size and appearance of a red currant; at other times, of a strawberry or raspberry; and occasionally it is even much larger, and is compared to a lobster.

When the circulation is active through them, or the individual is excited by exercise, or by moral causes, these marks are of a bright red color. Some are naturally livid and dark-colored, and look like blackberries, and black currants. The blueness of these is owing to the vessels being still more stretched and dilated, and to the consequent slower passage of the blood through them, which gives more time for its change from the arterial red to the venous blue.

**Treatment.**— If the mark is not making progress, it had better be let alone, or only subjected to gentle pressure by putting a piece of soap-plaster over it. When its course is threatening mischief, it is sometimes cured by pencilling a small portion of its surface, from time to time, with nitric acid. They may be operated on with safety by electrolysis and other methods.

### **Disordered State of the Nerves of the Skin.**

**Itching.**— *Pruritus.* This is supposed to be dependent on an altered condition of the nerves of the skin, and consists in a painful sensation of itching. There is no perceptible alteration in the appearance or structure of the skin. This itching is thought, generally, to be a result of sympathy, through the nerves, with some diseased and excited condition of a distant part. The itching is brought on by the most trifling causes, and for hours may deprive the sufferer of every particle of repose. It more frequently affects the fundament, or the private parts, particularly the scrotum.



**Treatment.**—As this disease is only a symptom of several others, the constitutional treatment belongs under the heads of these other diseases. The local applications for relieving the itching are, a solution of sugar of lead (224), hydrocyanic acid (363), of corrosive sublimate (212), diluted nitrate of mercury ointment, and poppy fomentations. Also (223). Tonics are often of first importance. Weak solutions of carbolic acid or soda water at times suffice.

## Disorders Affecting the Color of the Skin.

**Colored Patches.**—*Maculæ.* The depth of color in the skin depends on the amount of a certain coloring matter, called pigment, incorporated with the deeper and softer portion of the scarf-skin. In the scarf-skin of the inhabitants of northern latitudes, there is but little of this pigment; in that of the dwellers of Africa, there is a great deal; among the inhabitants of Southern Europe, the quantity is intermediate between the two.

The depth of color in the skin depends on the energy of its action. In the tropics, where light and heat are in excess, the skin is stimulated to great action, just as vegetation is, and the color is increased and intensified. This is illustrated every year before our eyes. In summer, under the heat of the sun and the flood of light, the pigment-forming power is increased, and the fairest skin is browned; while the withdrawal of these forces leaves the winter's scarf without pigment, and blanched.

What the sun and light do, under natural circumstances, diseased action may effect. Hence we occasionally meet with alterations of color in the skin, from a disordered state of the system. We witness the formation of patches of dark color and irregular shape on various parts of the body. Sometimes they are raised above the level of the skin, and are called *moles*. At other times, they have no elevation, and spread over the whole body.

Occasionally, from some peculiarity of constitution, the pigment is diminished, and white patches appear all over the body. At other times, a black person will become completely white. Such are called *albinos*.

In many cases the coloring of the skin has *varieties* of tint, as when persons of light complexion, are, in the summer season, covered with yellow spots, like stains. These spots are known by the name of *freckles*, or, in learned language, *lentigo*.

**Treatment.**—It is generally best not to meddle with a mole. If it be very unsightly, let it be removed by two incisions, taking out an elliptical portion of skin, and closing the wound with sticking plaster. In the case of bleached places, apply the shower bath, tonics, and a stimulating liniment (163) to the faded spots. For the change of color called sunburn, a liniment (191) of lime-water, etc., is the best preparation. For freckles, use recipe 360, or, perhaps, still better, 364.

## Disorders of the Sweat-Glands.

THE perspiration is sometimes greatly increased above nature's design. This is, technically, *idrosis*. In other instances there is too little sweating. This is called *anidrosis*. Sometimes the perspiration is so altered in its physical qualities as to have some peculiar smell. This is *osmidrosis*. In some rare instances, according to old writers, the sweat was changed in color. This was *chromidrosis*. And now and then a case occurs of bloody perspiration, of which the most memorable case on record is that of the Redeemer of men, who, in the garden, sweat great drops of blood. Several cases of this are recorded in medical books. It is called *hæmidrosis*.

The proper action of the skin being so vitally important to health, these changes often involve very serious consequences.

**Treatment.**— Either too much or too little sweating can generally be corrected by the cold or warm bath, friction, tonics, and proper clothing. Small doses of jaborandi, also ergot and strychnine, are among the best internal medicines (365).

## Disorders of the Oil-Glands and Tubes.

THAT the skin may be limber, healthy, and fit for use, it is necessary to have it oiled every day. For this object, the Creator has wisely provided, by placing in the true skin a large number of very small glands and tubes, whose office it is to prepare and pour out upon the surface the proper amount of oil. The gland, regular little oil-pot, is in the true skin; and from it a piece of hose or tube runs up through the scarf-skin, through which the oily fluid is poured out. Some of these tubes are spiral, others are straight. On some parts these vessels do not exist; on others they are quite abundant, — as on the face, nose, ears, head, eyelids, etc. They produce the wax of the ears; and on the head, they open into the sheath of the hair, and furnish it with a hair-oil or pomatum better than the chemist can make.

These little vessels are always at work, when the skin is healthy; and no persons need be afraid to wash all over every day, lest, as the *Boston Medical Journal* taught, the skin will be injured by having the oil removed from it. You might as well be afraid to eat a meal of victuals, lest the saliva should all be swallowed with it, and none be left for future use. There is oil enough where that upon the skin comes from, and the vessels which produce it are not injured by work, any more than the muscles of the legs are by walking.

**Grubs or Worms.**— But, unfortunately, the skin is not well taken care of in all cases, as in cities and towns where sedentary habits prevail. Here, the actions of the skin, instead of being regular and complete, are often sluggish and imperfect; and the contents of the oil-cells and tubes, instead of flowing easily, become hard and impacted, and the vessels are not emptied. When this matter becomes station-



ary, dry, and hard, it distends the tube, and fills it to the surface; and then coming in contact with the dust and smoke of the atmosphere, the ends become black, and look like the heads of worms. These spots are common on the nose and face of persons who have a sluggish skin. They may be squeezed out by pressing the nails on each side of them. These are called *grubs* and *worms*, or, technically, *comedones*. When this matter produces inflammation of the tube, there is then a black spot *in the middle of a red pimple*, and the disease is called *spotted acne*.



FIG. 77.

Now and then the oily matter becomes very hard, producing spine-like growths, and even horns (Fig. 77); and again, it collects and forms soft tumors, as wens, etc. These are technically called *encysted tumors*. Sometimes the action of the glands is too great, and oil is poured out so profusely that the face shines with it. At other times there is so little that the skin is dry and harsh. In the hardened oily matter, which constitutes grubs, are found small animals, which Dr. Wilson calls the “animal of the oily product of the skin.”

Below are three views of him.

**Treatment.**—For roughness and harshness of skin, wash with soap and water every night, and rub well into the skin after the bath, and in the morning, the ointment (362), and take a dose of sulphur, etc. (23), twice a week. Or, *rub* the skin every morning with a damp

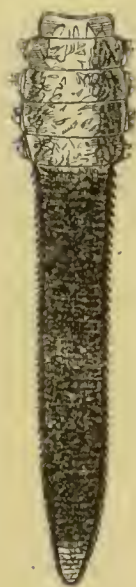


FIG. 78.



FIG. 79.



FIG. 80.

sponge dipped in fine oatmeal, and after drying the surface, the liniment (164) may be applied. The spinous variety, or porcupine disease, requires washing with a quart of warm water, having a large

teaspoonful of saleratus dissolved in it, and the use of the ointment (181) twice a day. For grubs, stimulate the skin by washing it with strong soapsuds, twice a day, and rubbing briskly with a coarse towel; and by using the corrosive sublimate (225) as a lotion.

A spare diet will do much towards improving the skin in many cases; use tonics in others. Usually, destroy the old skin first (360) and apply after (362) to heal.

### **Barbers' Itch. — Jackson's Itch. — Sycosis.**

THIS is very much like *acne*, — only differing from it in its location. It appears chiefly on the hairy parts of the face, — the chin, the upper lip, the region of the whiskers, the eyebrows, and the nape of the neck. It consists in little conical elevations, which mature at the top, and have the shaft of a hair passing through them. These pimples are of a pale yellowish color. In a few days they burst, and the matter running out, forms into hard, brownish crusts. These crusts fall off in one or two weeks, leaving purplish, sluggish pimples behind, which disappear very slowly.

The eruption is preceded by a painful sensation of heat, and tightness of the skin.

### **Barber's Itch.**

BARBER'S ITCH is a variety of ringworm though confined to the region of the face covered by the beard. Whether of the body, the scalp or the face, this disease is highly contagious, being communicated to other persons through the medium of soiled hands, unclean towels, razors, strops, brushes, etc. A vegetable fungus called the trichophyton is the source of the infection.

**Symptoms.**—Small reddish pea-sized rings with minute vesicles or watery blisters appear, they spread, branny scales form, the blisters mature, itching becomes noticeable and other areas rapidly take on the same appearances. The surrounding skin becomes congested and reddened, a gluey, yellowish, sticky fluid exudes from the scabs and thicker crusts pile up on each other. The hairs of the affected part break off very easily or fall out.

As this disease is so contagious, great care should be taken to use individual towels, that the face should be shaved if possible by the person afflicted and of course kissing the children or holding their cheeks up against the infected cheeks must be prohibited.

**Treatment.**—Although a tedious course may be expected to present itself, yet the greater the care used the sooner a cure will be effected. First with almond or olive oil soften the parts for two days, then shave every day or at least every other day, and after washing off with warm water apply freely an ointment of twenty grains of sulphur, fifteen grains of boracic acid mixed in half an ounce of benzoinated lard. This salve should be well rubbed in and a supply kept on the face, enough to make it look greasy day and night until cured.



## Disorders of the Hair and Hair-Tubes.

THE hair is an appendage of the scarf-skin, and is intended to be both useful and ornamental.

It is subject to several disorders. It may grow too long, or too thick, or it may appear in an improper place. This last happens in the case of those little spots and patches which disfigure the face, and are called *moles*. The hair may be defective in its growth, or may fall off prematurely from various causes, or in the natural course of things from old age. This last is called *calvities*. It may change its color, too, under a great variety of circumstances, and at nearly every age. It is not very uncommon to find a single lock varying in color from that which surrounds it. Old age, the winter of life, naturally brings the frosted locks; but they frequently appear also upon the heads of younger persons. Strong mental emotions, such as fear, grief; or sorrow, may bring a bleaching of the hair in a brief period, or even suddenly.

**Porriigo.**—There is a troublesome disease of the hair and hair-tubes called *porriigo*. It begins with the formation of a thin layer of scurf either around single hairs, or in patches which enclose several. These patches frequently have a circular form, which give to the affection the character of a *ringworm*. The hair-tubes are generally a little elevated, in the shape of papillæ, which gives to the diseased scalp the appearance of “goose-flesh.” These hairs, losing their proper nourishment and healthiness, break off at unequal distances from the skin, leaving their rough ends twisted and bent, and matted into thick grayish and yellow crusts. Upon the surface of these crusts may generally be seen the ends of a few hairs, looking like the fibres of hemp or tow. The scratching causes inflammation of the skin after a time, and matter is poured out, which still further mats the hair, and thickens the crusts. There are several varieties of this disease, differing slightly from each other; but this general description will answer all practical purposes for this work.

The reader will often notice a disease of the hair-glands, characterized by a yellowish and dirty-looking powder, covering the scalp and hairs. This matter is collected at the mouths of the follicles, and considerable of it is strung upon the hairs like beads. Pull out a hair, and the root will be found thin, dry, and starved in its appearance. In this disease, it is difficult to keep the hair cleansed, or to prevent its falling off.

**Favus.**—Still another disease, called *favus*, is known by the collection of a yellow substance, at first, around the cylinder of the hair. This substance, after a time, spreads out upon the scarf skin, and dries into yellow crusts, in the form of a cup, around the base of each hair. A number of these cups, collected together, look like the cells of a honey-comb. This disease is contagious, and is communicable by contact to any part of the skin.

**Treatment.**— For removing the hair from particular parts of the scalp, it is common to resort to *depilatories*. Of these, the recipes 260, 261, 262, are frequently used, and are as good as those advertised; indeed, they are the same. Forceps are the best means.

To prevent loss of hair, and to restore it when lost, the circulation should be stimulated in the small vessels of the scalp. With this view, washing the head every morning with cold water, drying it by friction with a rough towel, and brushing it to redness with a stiff hair-brush, are excellent. To these should be added some stimulating ointment (183), or liniment (257), (258), (259). These last are about the best known preparations for causing the growth of the hair.

**Ringworm** of the scalp requires attention to the diet, and such remedies as will improve the general health, with stimulating applications externally (257), (258), (259). 366 is the newest and best mode.

To color the hair, several preparations are used. Of these, 263 is about the best. It produces a beautiful black. A preparation of sulphur and sugar of lead (264) is the famous compound recommended by General Twiggs, and extensively used. Preparations of nitrate of silver (265), (266), (311) are much in use in some quarters. They perhaps give a finer black to the hair, but they render it dry and crisp, and they will stain the skin, if care is not used in applying them.

Use care in the use of these remedies.

**In Favus**, the two great objects to be gained are, to remove all local causes of irritation, and to excite the diseased hair-glands to healthy action. The first object is affected by cutting off the hair with the scissors, and removing the crusts by washing the scalp with castile soap and water. It may be well first to wet the crusts through with corrosive sublimate (212), in weak solution. The washing with soap and water should be repeated every day, and be followed by rubbing into the scalp a stimulating ointment (183). A very weak solution of the nitrate of mercury (226), applied every other day, with a camel's hair brush, sometimes produces excellent effects.

## Lice.

**Pediculosis or Lice** is a contagious, animal, parasitic affection, characterized by the presence of pediculi in the skin and scratch-marks of the sufferer ensuing from the annoying itching. There are a number of varieties classified according to the peculiar parasite and its location. They all cause great discomfort and itching.

**The Pediculosis Capitis**, or head-louse, is found in the scalp, and is a long, oval body with six legs furnished with nails; it has an oval head with two prominent eyes and two horns. The ova or *nits* are



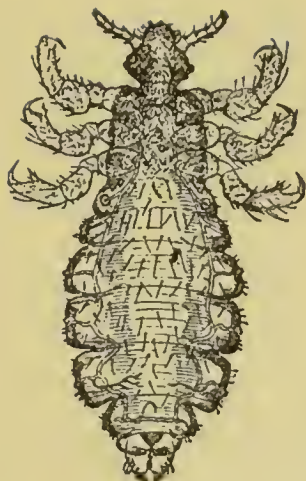


FIG. 81.  
HEAD-LOUSE.

small whitish bodies closely glued to the hair and look like small pieces of dandruff. One or two are deposited on a hair.

They occur for the most part in poorly nourished children brought up under bad hygienic surroundings, and thence communicated to others. They cause extreme itching and scratching, so that often the irritation is unbearable and the sticky serum of the blood mats together the hair, forming crusts. Sleep is often interfered with and ill health results. (See Fig. 81.)

**Pediculosis Corporis**, or body-louse, is generally the property of the clothing; it is somewhat larger than the head-louse and deposits its eggs in the seams of the clothing, remaining on the body only long enough to gain sustenance. The young are hatched in five or six days. The louse reproduces again in eighteen days. As the parasite crawls about it produces extreme itching and the scratching follows, resulting in long lines of excoriation. The chief locations for this parasite are the back, chest, abdomen and thighs. The middle-aged and elderly are more apt to be attacked than the young. Here uncleanness again is a prime factor in their occurrence. (Fig. 82.)

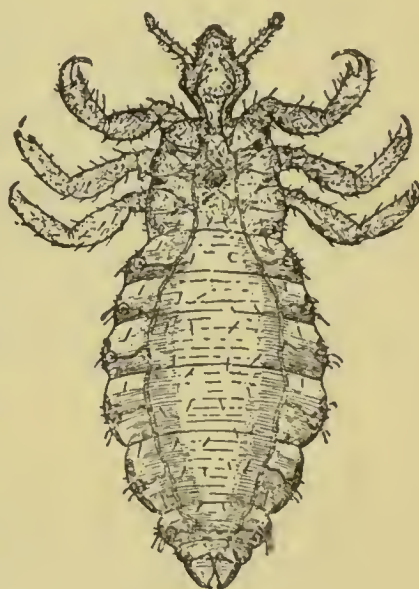


FIG. 82.  
BODY-LOUSE.

**Pediculosis Pubis**, or crab-louse, is a smaller, shorter, stouter parasite than the two preceding, and attacks the pubes particularly, but is also found in the axillae and over the eyelashes and beard of the male. They may be seen clinging closely to the skin with remarkable tenacity. They occur on adults and produce the same lesions as the other varieties. They are generally the result of promiscuous sexual intercourse. (Fig. 83.)

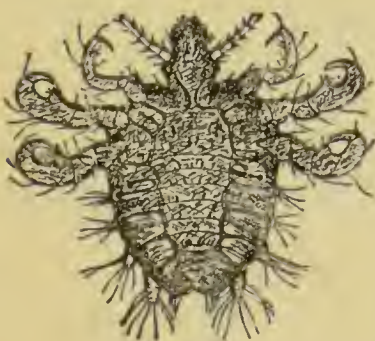


FIG. 83.  
CRAB-LOUSE.

**Treatment.**—The main object in the treatment of these filthy diseases is the destruction of the parasite. The lesions they produce disappear with the disappearance of the animal. It need hardly be said that strict cleanliness of person is a *sine qua non*. The remedies usually employed in their extermination are the mercurials, sulphur, carbolic acid, tobacco, etc.

In case of the head-louse the most efficacious method of treatment consists in saturating the head over night

with petroleum and washing off with soap in the morning. In young children the hair may be cut to get rid the more easily of the nits, but this is not necessary. The applications of petroleum may have to be repeated several times and the hair frequently washed with soft soap, soda washes, vinegar, etc., to get rid of the nits. If the louse be of the body variety the treatment must be directed to the clothing, which is to be changed often and either boiled or baked. This process is to be repeated until no more parasites are found. The itching of the body is best allayed by carbolic acid lotions (one teaspoonful to pint of water).

The crab-louse is best treated by the well-known mercurial ointment, or blue ointment, and is to be washed off with soap and water each morning. It must be persisted in till no more crabs are found and no further itching is noticed.

### Bed-Bugs.

THE best preventives against these annoying bugs is corrosive sublimate and pyrethrum powder. Purchase a small bottle of the corrosive sublimate tablets, usually sold at the druggists for surgical purposes, and dissolve one in a quart of water. This solution is to be freely used about the cracks of the bed, after it has been taken apart, and also about any wooden furniture of the room as well as the woodwork of the room. The powder is then to be used freely. This process is to be repeated several times.

The bites themselves are best relieved by carbolic lotions, vinegar and water, ammonia and water, etc.

### Freckles.

THIS is a disease of the pigment layer of the skin and consists in a deposit of the coloring matter of the skin in irregular shapes, of the size of a pin-head or pea, and are yellowish, brown or even blackish, occurring for the most part on the face and back of the hands. They may be few and scattered or exceedingly abundant and cover a large area. All ages are subject to them except in very young children. The light-complexioned are more subject to them, while the red-haired seldom escape them. Sunlight develops them so that many have them conspicuously only in summer. The possession of freckles is a matter greatly of idiosyncrasy, as many people never have them, no matter how much they may be subjected to the sun.

**Treatment.**— One's aim in treatment should be toward destroying the pigment layer by some corrosive agent, like corrosive sublimate, which perhaps is the best remedy.

Two grains to the ounce in water will in most cases prove sufficiently strong. The susceptibility of the skin to this remedy and the extent of the area involved have much to do with the strength of the



remedy employed. This remedy is poisonous and is to be used with care. Do not get it near the lips, but to effect a cure it must be persisted in for quite a while.

Washing the face in buttermilk several times a day is excellent.

**Corns.**

OF all the minor ailments of the human body, few are more distressing than the inflamed corn. They consist of a thickening of the outside or horny layer of the skin. As a secondary change, consequent on long irritation, the nerve and blood supply increase and an extreme tenderness is produced, amounting often to incapacity to walk or work. They are caused mechanically by the undue pressure of the boot against the joint or by one toe pressing against another. Too short a boot, which causes pushing out of the big toe joint, too narrow a boot, causing crowding of the large joints, are the more frequent causes of the corn.

**Bunion.**

THE bunion is produced by wearing too short a boot, as a rule, and consists in the gradual displacement of the big-toe joint, so that finally there is an actual deformity. The corn usually is added to this deformity.

**Treatment.**— The outer layers of the corn should be softened and scraped off by a sharp, thin knife. The softening process may be effected by soaking in a soda solution, or better still, by the following mixture: —

- Salicylic acid . . . . . one-half ounce
- Extract cannabis indica . . . . . ten grains
- Collodion . . . . . one scruple

This is to be applied each night. Care is to be exercised in not paring the corn too closely lest bleeding occur and poisoning ensue from the unclean knife that may be used. Pressure of the boot must be avoided by the substitution of another form of boot and also perhaps by wearing a plaster with a hole in the center, thus distributing the pressure over a greater area. When trimmed the corn is to be likewise covered by a corn-plaster bound on the foot by strips of adhesive plaster. Painting with iodine often takes out the soreness and hardens the skin so that it may be more readily cut. Inflamed corns should be poulticed and treated like any pus wound. Spirits of turpentine will often take the soreness out of a corn. Absorbent cotton, or better, wool, worn between the toes, will prevent or cure a corn between the toes.

**Dandruff.**

THIS is a disease of the sebaceous glands of the scalp, characterized

by a large secretion of the sebaceous matter and forming crusts or scales. The secretion may be so thick and oily as to mat together the hair, or so dry as to fall off the head in a shower when the head is combed. It is the most frequent cause of baldness. The crown of the head is the most frequent location of this disease.

**Treatment.** — Inasmuch as those subject to this disease are often below par in health, such constitutional remedies as cod-liver oil and iron are valuable adjuncts in bringing about a cure. Should the amount of scales be considerable, especially if there are crusts, as in the case of little children, the best procedure consists in oiling the scalp over night with some bland oil, wearing a flannel cap, and washing off the oil in the morning with soft-soap and water. The following blood tonic is an admirable one for adults: —

Tincture of iron . . . . .	one ounce
Dilute phosphoric acid . . . . .	one ounce
Syrup of lemon . . . . .	two ounces

Take one-half teaspoonful in a wineglass of water three times daily. Use a glass tube to avoid staining the teeth. The scalp needs a shampoo once or twice a week; the following will be found to be a suitable one: —

Green soap . . . . .	eight ounces
Alcohol . . . . .	four ounces

Put a little here and there over the scalp and then rub up with warm water. The scalp may then be stimulated night and morning with a little of the following lotion: —

Tincture of cantharides . . . . .	three drachms
Tincture of capsicum . . . . .	three drachms
Castor oil . . . . .	two drachms
Alcohol . . . . .	two ounces
Spirits rosemary . . . . .	two ounces

Another good remedy for daily use: —

Hydrate of chloral . . . . .	two drachms
Water . . . . .	four ounces

The yolk of two eggs well rubbed into the scalp and afterwards washed off with hot water is also a good cleansing agent and shampoo.

For very stubborn cases the following lotion applied night and morning will be found efficacious: —

Corrosive sublimate . . . . .	12 grains
Glycerine . . . . .	4 drachms
Alcohol . . . . .	5 ounces
Spirits rosemary . . . . .	4 drachms

Whatever method is pursued, the application must be persevered



in and applied from twice daily to once every few days according to progress made and severity of case.

### Baldness.

THIS disease is generally the outcome either of some constitutional weakness and requires general tonic treatment like iron and cod-oil, or is the result of some local lesion of the scalp proper. When due to syphilis, the hair falls out suddenly and quite extensively; the eyebrows also suffer the same way. Its treatment is to be conducted on the same plans as directed under treatment of the syphilitic disease. Eczema, scrofulous blood, etc., may also be the exciting cause of baldness. Baldness may ensue in areas only, and oftentimes is as complete as though no hair had ever grown there. This form is apt to be very stubborn and requires very irritating treatment, like blisters or the rubbing in of strong carbolic acid once a day for a number of days before ceasing treatment.

The baldness of old age is of course irremediable, but may be arrested by attention to the general health and the employment of remedies mentioned under the consideration of dandruff.

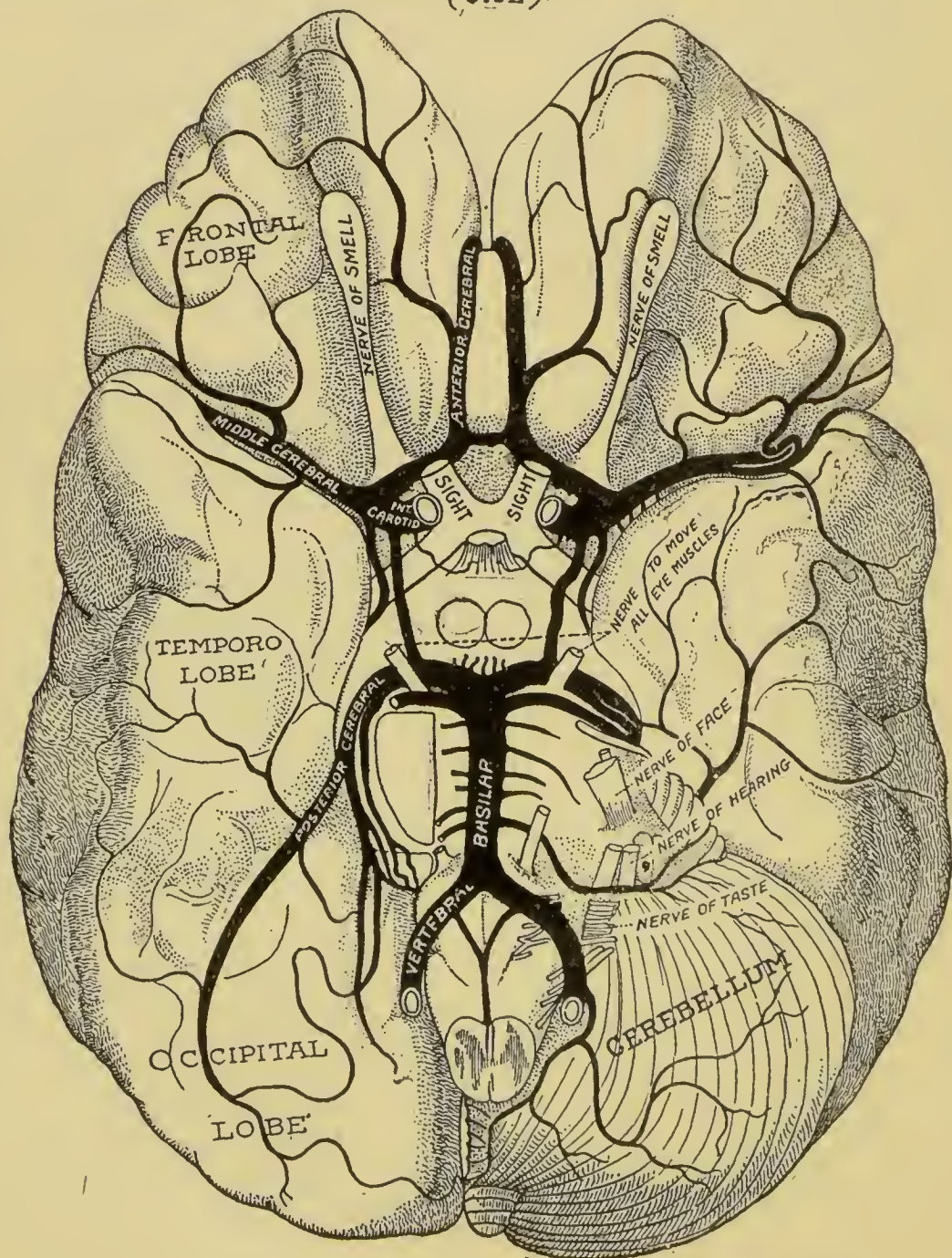
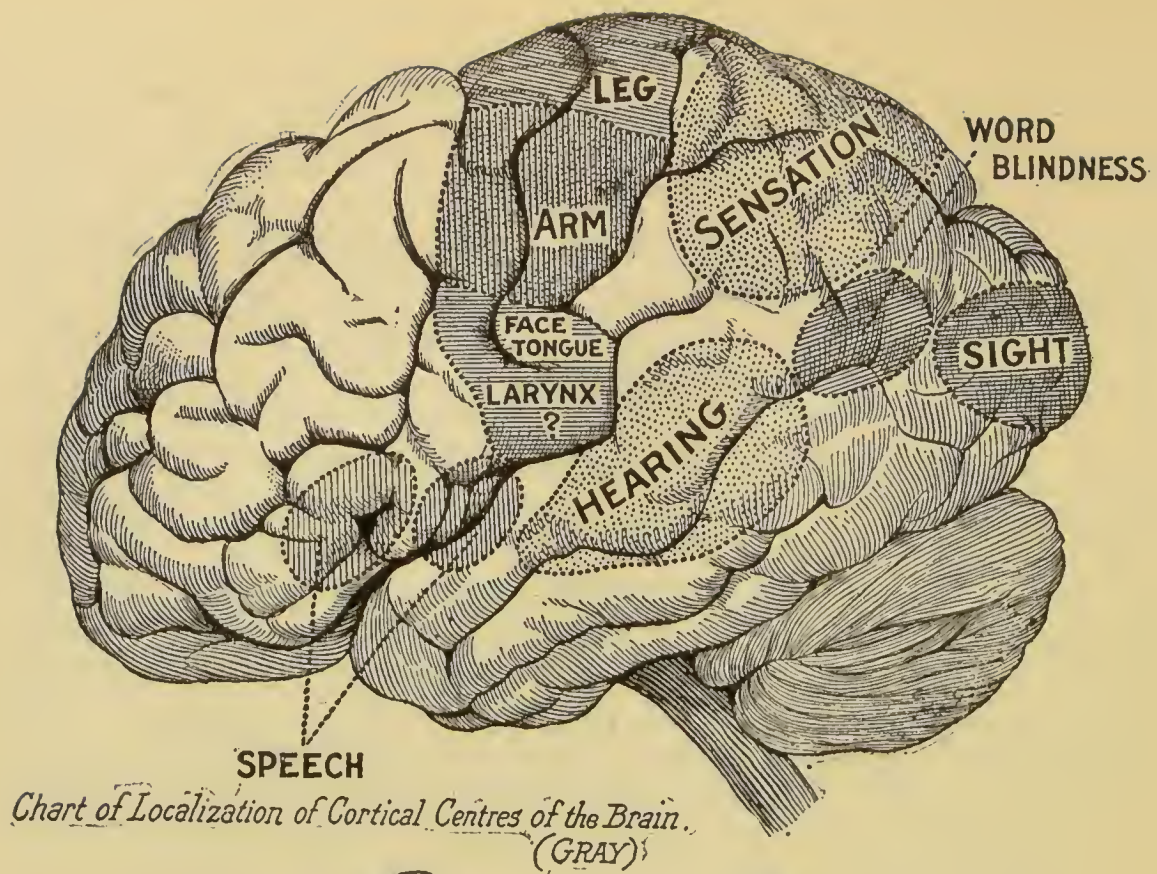
As has been mentioned, dandruff is the most fertile source of baldness. When once the scalp is clean and the dandruff is cured the following lotion will be found to be of great value in those cases of baldness characterized by the hair falling out in small patches:—

Carbolic acid . . . . .	one drachm
Alcohol . . . . .	one and a half ounces
Castor oil . . . . .	two drachms
Oil bitter almonds . . . . .	ten drops

The following lotion also contains desirable ingredients:—

Tincture cantharides . . . . .	one and a half ounces
Tincture capsicum . . . . .	one and a half ounces
Castor oil . . . . .	two drachms
Cologne . . . . .	one ounce





*Nerves and Arteries of the Brain.* (GRAY)



DISEASES of the BRAIN and NERVES

# DISEASES OF THE BRAIN AND NERVES.

(Also see Anatomy of Brain and Nerves.)

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THE brain and spinal column are the great centres of the nervous system.

The brain produces *sensation, thought, and voluntary motion*. When this organ is diseased, therefore, we may expect one of these functions to be either disturbed or destroyed.

**Of Sensation** there are various disturbances, perversions, and suspensions, caused by disease of the brain and nerves; such as nausea, giddiness, specks floating before the eyes, ringing in the ears, deceptive tastes and smells, intolerable itching, neuralgic pains, boisterously high spirits, depression without apparent cause, anxiety, and dread.

**Thought**, in like manner, is disturbed and perverted in many ways. There is high delirium, dullness and confusion, loss of memory, weakened judgment, and every degree of stupor, down to entire loss of consciousness.

**Voluntary Motion** is perverted and destroyed in muscular twitchings, trembling of the limbs, spasmodic stiffness, involuntary jerkings, convulsions, muscular debility, and palsy.

The brain is composed of three parts,—the *cerebrum*, the *cerebellum*, and the *medulla oblongata*. These are all contained within the skull bones, and are immediately covered by three membranes, called the *dura mater*, the *arachnoid*, and the *pia mater*. The *dura mater* is a strong, *fibrous* membrane lying next to the skull-bones. The *arachnoid* is a *serous* membrane, lying next below, and the *pia mater*, which means pious mother, is a *vascular* membrane, lying next to the brain, dipping into it in places, and containing the vessels which bring to it all its nutrient materials. Hence its name.

These membranes are all liable to be inflamed,—and so is the brain.

## Inflammation of the Dura Mater.

THE inflammation of this membrane does not often occur spontaneously; but it happens frequently from external injuries, as blows upon the head.

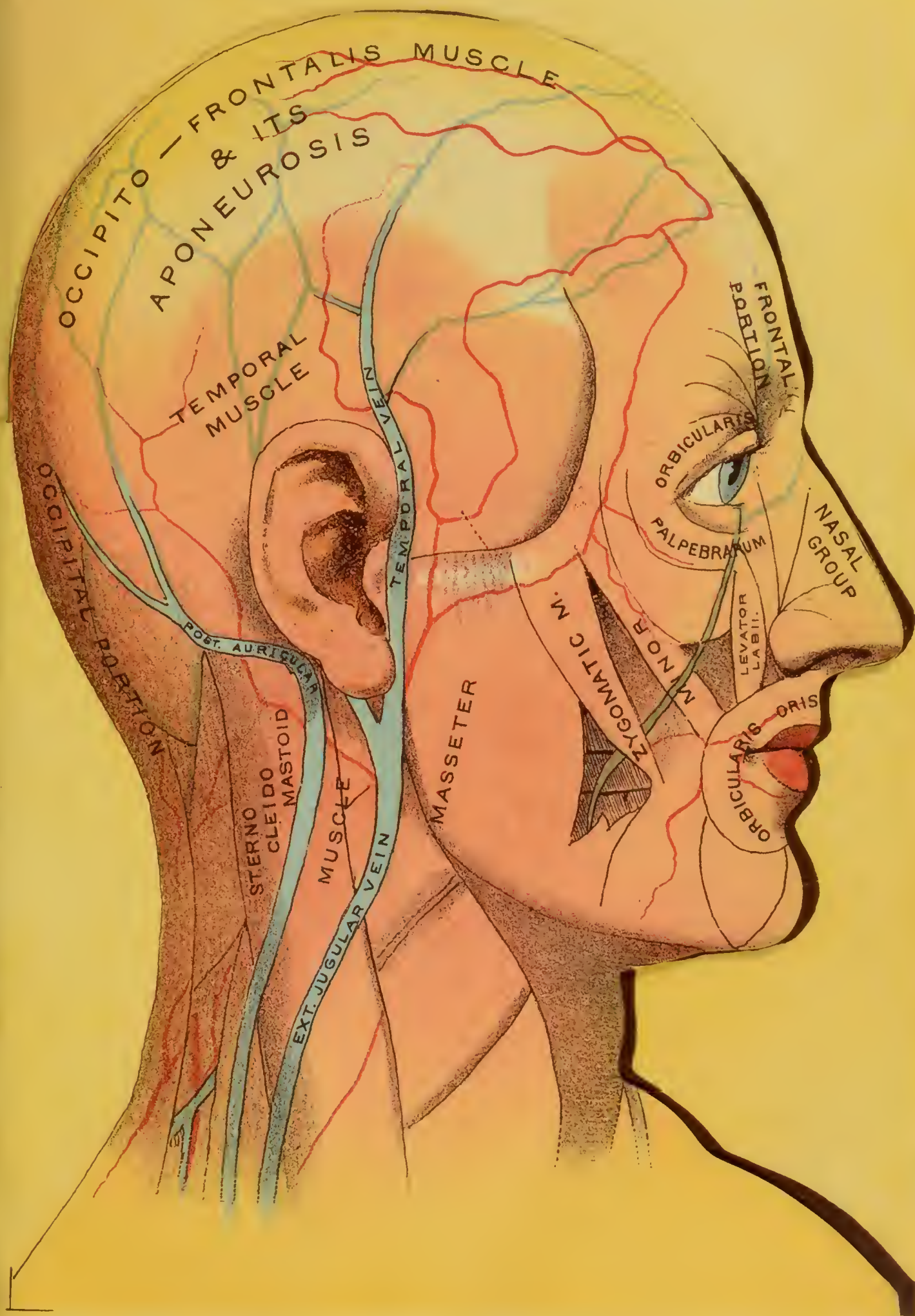
After a blow upon the head which stuns him, a man may recover himself, and for some days remain in perfect health. Then he has





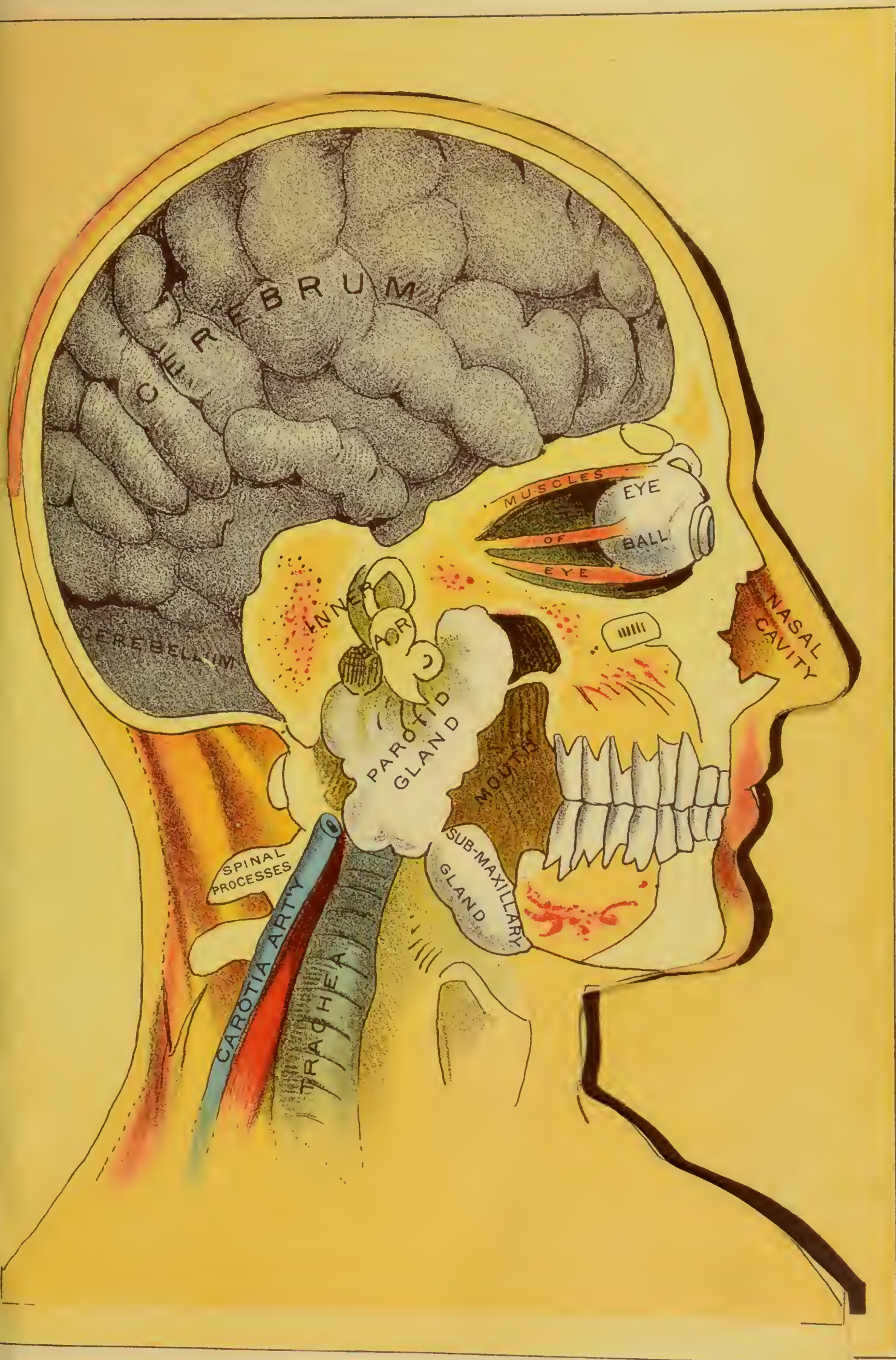






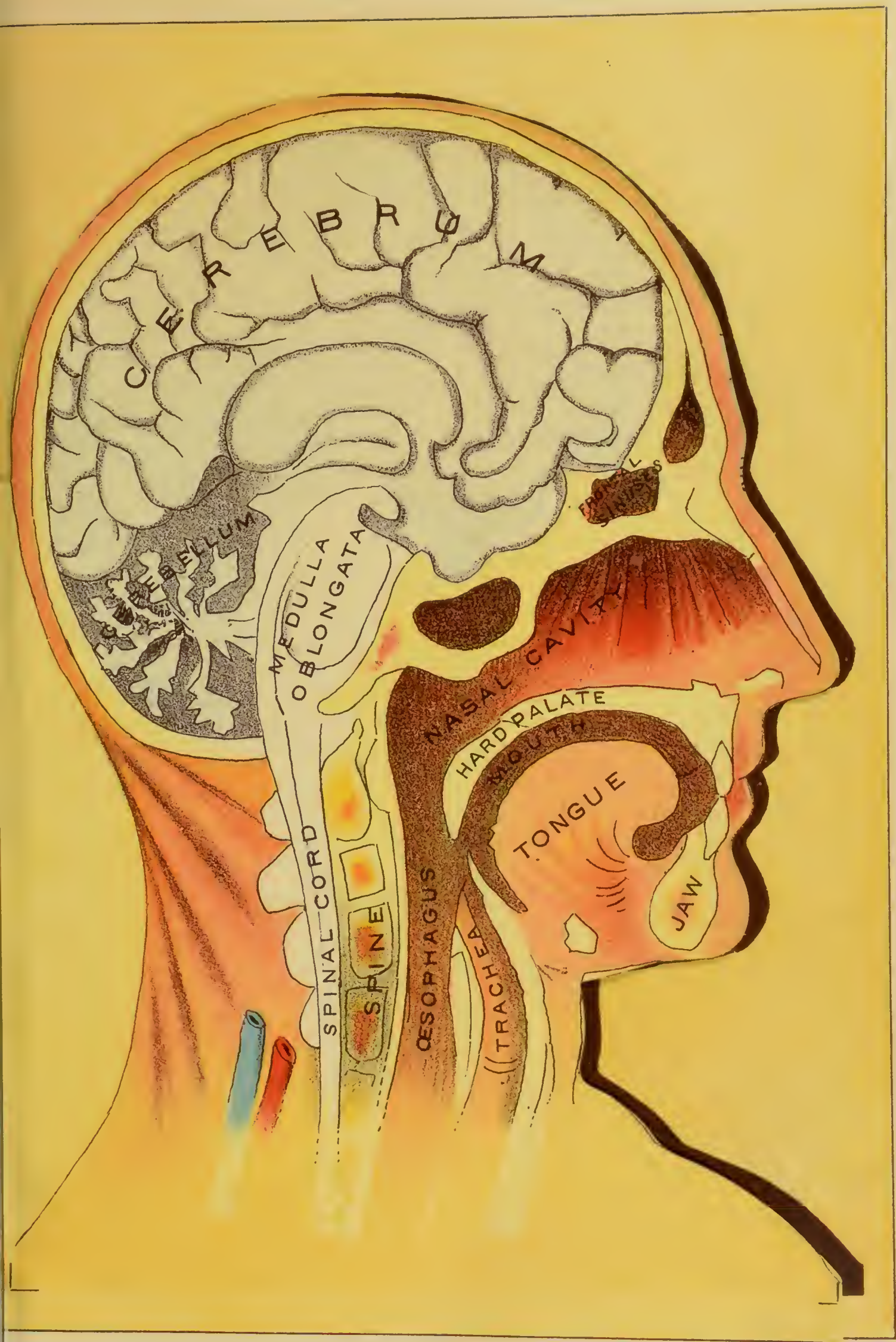












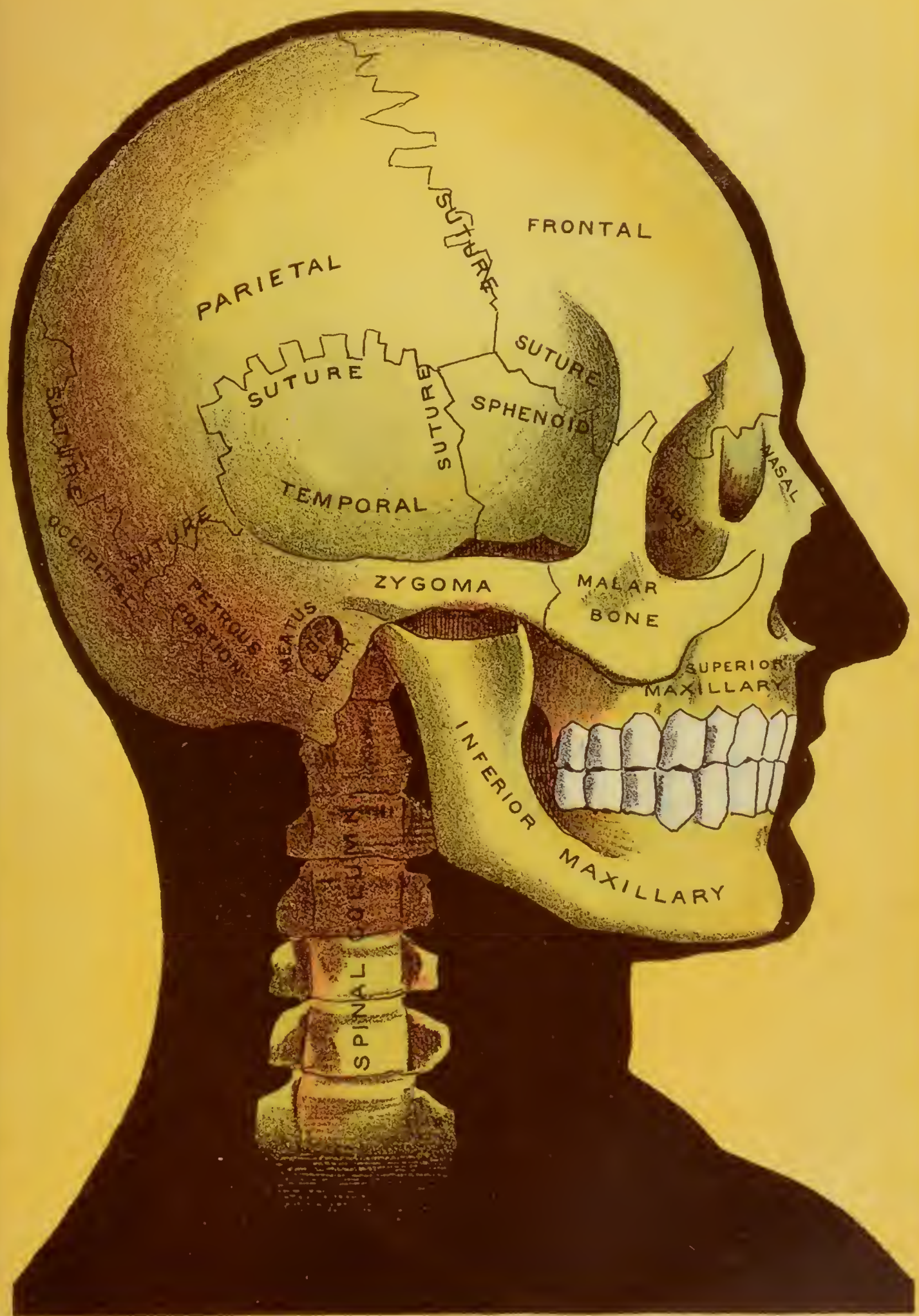
















pain in the head, is restless, cannot sleep, has a flushed face, red eyes, hot skin, hard pulse, rigor, nausea, vomiting, — ending with convulsions and delirium.

This disease is often caused by what is called *otitis*, or inflammation of the internal ear. In such cases, inflammation will arise within the tympanum, causing intense earache; matter comes at length from the external ear, but the pain does not stop; the patient shivers, becomes drowsy, perhaps delirious, and finally sinks into stupor. The dura mater is inflamed.

**Treatment.** — When the disease arises from inflammation in the ear, leeches are to be applied behind the ear, and blisters and other irritants afterwards. Other modes of treatment will be mentioned after the next two forms of disease.

## Inflammation of the Arachnoid and Pia Mater.

### *Arachnitis.*

THESE two membranes are generally inflamed together. They are so intimately connected that each involves the other in its own troubles.

Generally this is divided into three stages: —

**The Irritative**, characterized by wakefulness, irritable temper, repugnance to strong light, and contraction of the pupils.

**The Inflammatory Stage**, known by transient pains in the head, alternating with similar ones in the bowels, increased restlessness and irritability, a quick and tense pulse, an expression of discontent on the face, the eye-brows knit and frowning, the eye-lids half closed, retching and vomiting, deep sighing, and torpid bowels.

**The Depressing Stage**, in which the delirium is more continuous, the countenance has a look of surprise and stupor, the pupils are contracted or dilated, the white of the eyes injected and red, the pupils rolled up during sleep, constant sleepiness, inattention to surrounding objects, torpidity of mind, gradually increasing until complete coma closes all the senses.

The disease does not always exhibit all these symptoms, or come on in the regular way described. Sometimes the first thing noticed is a long-continued paroxysm of general convulsions. Again these convulsions will come on after violent pains in the head, and are attended with screaming.

## Inflammation of the Brain. Brain Fever.

### *Encephalitis. — Phrenitis.*

ACUTE and general inflammation of the brain and its membranes has two stages.

**The Stage of Excitement**, in which there is intense and deep-seated pain in the head, extending over a large part of it, a feeling of tight-

ness across the forehead, throbbing of the temporal arteries, a flushed face, injected eyes, looking wild and brilliant, contraction of the pupils, great shrinking from light and violent sound, delirium, want of sleep, general convulsions, a parched and dry skin, a quick and hard pulse, a white tongue, thirst, nausea and vomiting, and constipation of the bowels.

**The Stage of Collapse,** in which there are indistinct mutterings, dull and perverted hearing and vision, double vision, the pupil from being contracted expands largely and becomes motionless, twitchings of the muscles, tremors and palsy of some of the limbs, a ghastly and cadaverous countenance, cold sweats, profound coma, and death.

The disease will not show all these symptoms in any one case. It runs a rapid course, causing death, sometimes, in twelve or twenty-four hours; or it may run two or three weeks.

**Treatment.** — This should be energetic, and administered *early*. The measures usually employed are *hot foot-baths*, and the *application of cold to the head*, with occasional mustard poultice to legs.

**General Blood-letting.** — This is much approved by many; for myself, I do not like it. Wet cups and leeching are about the extent to which I would ever carry the abstraction of blood in these diseases. These may sometimes be applied with advantage to the neck, and behind the ears.

**Cold Applications.** — These, applied to the head, are of great importance. First, shave the head, and put on cloths wetted in water as cold as it can be made, changing them often; or, put powdered ice in a flexible bladder, and lay it upon the head, — taking care not to make it too heavy. Heat in a few cases is better borne.

**Cathartics.** — These, while the inflammation is in the active stage, should be thorough and energetic. To effect it, many use calomel and other forms of mercury. They are not needed. Croton oil is one of the best articles (31), or colocynth, gamboge, etc. (32), without the oil, or the compound powder of jalap.

In the stage of collapse, if there is pallor of the countenance, a feeble and flying pulse, great debility and tremors, coldness of the extremities, etc., give wine and other stimulants.

See that the bladder is emptied every day.

The feet, in the early stage of the complaint, should be bathed in warm water, or mustard and water (242). Mustard draughts must also be put upon the feet.

The tincture of veratrum, given in full doses, to bring down the pulse, and produce sweating, must not be omitted. Give (351).

### **Softening of the Brain. — *Ramollissement*.**

**INFLAMMATION** of the brain, when it has run its course, sometimes leaves this organ, or portions of it, in a softened condition. The



same mischief may happen to the brain from the blood-vessels which run to it being diseased, so as not to be able to carry blood for its proper nourishment.

**Symptoms.**—The most remarkable symptom of this disease is the rigid contraction of the muscles which draw up the limbs; the hand may be clenched and pressed against the shoulder, or the heel carried up to the hip.

The early symptoms are tingling, numbness in the ends of the fingers, perverted vision and sometimes blindness. The person usually tidy in habits and dress now becomes careless and slovenly. He occasionally complains of sleeplessness and the temper becomes irritable and friends notice that he takes offense when usually he would not notice. His forgetfulness is very noticeable at times to the extent of forgetting his name and that of his family, later on the symptoms are similar to those which will be described under the heading "Dementia."

### **Suppuration and Abscess of the Brain.**

WHEN a diseased brain is examined after death, sometimes matter is found mixed in with the softened portion. This shows that suppuration took place. At other times, the matter is found in a cavity, which shows that an abscess had formed during life.

The symptoms of these mischiefs are convulsions in the earlier stages, and palsy in the latter. Surgical methods now often save life, and cause a cure in these cases.

### **Induration of the Brain.**

INSTEAD of softening the brain, inflammation sometimes does the very opposite, — it hardens it, — producing a change something like that which happens to white of egg when dipped in hot water.

Convulsions appear as the result of this change, as in suppuration and abscess; palsy much more seldom.

### **Tumors of the Brain.**

TUMORS infect the brain occasionally, — growing around it, on all sides, pressing themselves into its substance, and causing many disturbances. Cancers and hydatids are found there. The signs which these irritating bodies produce are like those of other diseases of the brain, and therefore cannot be distinguished during life. Syphilis is often the cause of them, and, when due to this, may be cured.

### **Delirium Tremens.—Drunkard's Delirium.**

*Mania a Potu.*

THIS is often mistaken for brain-fever; but it is quite a different

disease. It is not the result of *inflammation* of the brain, but of *irritation*. It is important to distinguish it from inflammation, because the remedies which are employed for that would be injurious if used for this.

**The Symptoms** are incessant talking, fidgeting with the hands, trembling of the limbs, a rapid pulse, profuse sweating, utter sleeplessness, and a mingling of the real with the imaginary in the busy talk. The patient is apt to think some one is about to do him a great injury, yet is unwilling to be alone. His face is pale and sallow (sometimes red and flushed), his eye is rolling, quick and expressive, his speech stuttering and inarticulate,—bodily and mentally, he is *busy* day and night, and can with difficulty be confined to his bed or room. As the disease advances, and he has been long without sleep, he imagines vermin to be crawling upon his scalp and body; troops of rats run across his bed, or look at him out of the wall; giant boxers confront him, and he squares off for a round at fisticuffs; animals, figures of all shapes, and horrible monsters frighten his imagination; devils laugh at him, and dance before him. In long and sleepless hours, he talks and chatters with these spectral phantoms,—now beckoning them, now shrinking from them, till he wears out and sinks from exhaustion. This is a disease of drunkards and opium eaters. The attack generally occurs in consequence of the withdrawal for three or four days of the accustomed stimulus.

If the delirium is the result of recent heavy drinking, an emetic should be administered to empty the stomach of what is remaining there. Sulphate of zinc, 20 grains well diluted with water, or ipecac, 30 grains may be given, after which a good cathartic such as 30 grains of compound jalap powder for unloading the bowels may be used. If the patient is depressed and nervous, spirits of aromatic ammonia may be used. In more marked cases, strong black coffee by the mouth or rectum; even strychnine in 1-30 grain doses will be needed for the heart. Bromide of soda, 30 grains dissolved in one-third glass of water may be given every two hours to keep the patient quiet. Morphia and the other preparation of opium, while very valuable, should be used with great care; 20 drops of laudanum every two hours for two or three doses will usually, in conjunction with the bromide, quiet the patient, but the exclusive administration of opium or giving it in large amounts should be under the control of a physician. Bathing the patient in the tepid bath, during which cold applications are kept on the head, may be used for hours at a time if the patient does not rebel at this treatment, but usually the quieter he can be kept the sooner he will recover.

### **Inebriety.—Drunkenness.**

IN the beginning of the present century insanity was regarded as a visitation of God's displeasure and not as a disease subject to scientific investigation and amenable to treatment. Inebriety is regarded now



as insanity was some hundred years ago, the disease being considered irremediable. Alcohol is a poison, and like other poisons is capable of destroying life. In large doses it becomes a powerful irritant or a narcotic producing coma and death. It being constantly introduced into the system produces a general disease in the system. We believe inebriety can be cured like any other disease, but is subject to relapses like other diseases.

The "alcohol habit," under the title Inebriety, oftentimes has the symptom or outward manifestation of diseased conditions, which antedate the alcoholic craving, and are its predisposing and exciting causes which retard, and sometimes even prevent a cure.

In the popular, and too often in the professional mind, alcohol is regarded as the cause and root of the whole evil of inebriety. We desire to assert that inebriety is frequently dependent upon causes with which alcohol has nothing to do. There is a neurotic craving—it may be congenital, it may be developed as the result of disease or accident. This craving demands the various forms of narcotic stimulants, those that first excite, then produce narcosis more or less complete. Alcohol fulfills this condition, is easily accessible, reasonably inexpensive, and is the one drug that meets a morbid craving that seems to be almost universal.

We do not fail to recognize the deteriorating effects of alcohol manifested principally, at least, more pronouncedly upon the nervous system as seen in the various forms of insanity. We also note the degenerating effects of alcohol on lung, liver, kidney or other organs and tissues of the body; or as a special poison in the same sense that lead, arsenic and tobacco produce their effects.

We believe that the great majority of inebriates become so from heredity, environment and disease, that produces physical degeneracy and pushes them over and plunges them into inebriety.

The patient with fever craves and may drink water freely, excessively and injuriously. The diabetic is an aqua-maniac in a certain sense, but in neither case do we recognize the aqua-mania or water craving as the disease, but rather as proceeding from certain abnormal conditions which we readily recognize. So the liquor thirst is the result of morbid conditions that produce an abnormal desire, which alcohol seems, temporarily at least, to satisfy.

The excessive use of alcohol, while it is oftentimes the cause of various diseases of the nervous system, and also a frequent cause of insanity, is also the precursor or initiatory symptom of certain diseases of the nervous system and also of insanity.

The paretic will crave and use alcohol in the earlier stages of his malady. The victim of nervous syphilis is addicted to it, more especially in the later stages, when the nervous system becomes involved.

Any depressing, exhausting, or painful disease may produce the alcoholic craving, alcohol being sought for its stimulating properties.

Alcohol, moreover, is second only to opium, ether, or chloroform as an anæsthetic; indeed, has been used as a substitute for the latter. Hence, persons find experimentally that alcohol relieves pain, and its use is carried to a harmful extent, its deleterious effects produced, and inebriety established.

It is possible that a healthy individual, with good personal and family history, may use alcohol sociably or as a matter of custom, until the habit becomes firmly established.

The alcohol breaks down the constitution, invades and degenerates the nervous system, and thus develops inebriety, because the alcoholic degenerations, or even functional disturbances of the nervous system, are the very conditions under which inebriety is established. We say this is possible, but we assert again that behind the large majority of inebriates will be found a defective family or personal history, not only complicating but causing the inebriety; retarding, oftentimes preventing a cure.

It can be thus seen that inebriety is but a symptom — a flag of distress hung out by the nervous system. As some one has aptly said, “neuralgia is the cry of a diseased nerve,” so the “drink-craze” is the cry of the neurasthenic for a stimulant, of the pain-tortured nerve for an anæsthetic, of the victim of insomnia for a hypnotic.

Not any patient that applies for relief to the physician needs a more careful examination than does the inebriate. You may rest assured that there is some underlying cause, probably several that must be removed if we would restore the inebriate to his former habits of sobriety. If he is found suffering from the later manifestations of syphilis he will need special treatment for this condition, especially if the nervous system is involved; a painful stricture of the urethra may require division.

Chronic malarial poisoning with its complicating disorder of stomach, liver and spleen, will demand special treatment. In a case on record the irritation of a tape-worm produced a tendency to the excessive use of alcohol, which tendency passed away when the worm was expelled.

In a word, a large majority of inebriates are diseased persons, and that primarily and antecedent to their inebriety, which is appended to and aggravates their diseased condition.

Special diseases, therefore, require special treatment, irrespective of the inebriety, if we would cure the inebriate. In this connection we may ask, are there any drugs that we can substitute for alcohol that will take its place, and satisfy the inebriate, as a substitute for alcohol?

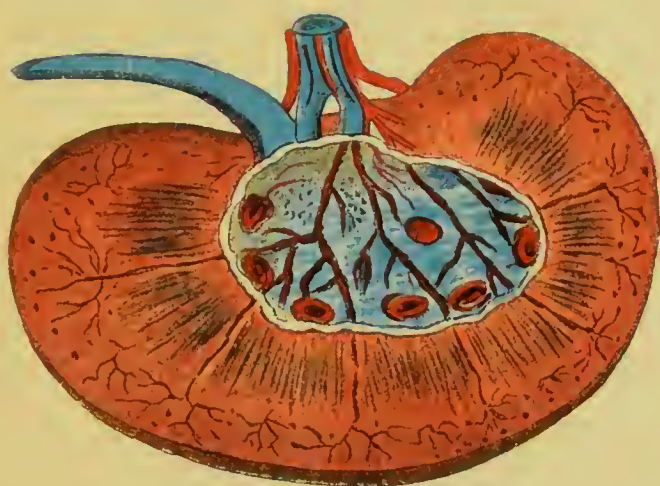
Opium and the salts of morphia will do so in a marked degree, although cocaine, chloral and the bromides have been so used.

The use of opium or morphia is not uncommon among inebriates who desire to “leave off alcohol.” The inebriate, as a rule, is a congenital neurotic. From birth almost, he reaches out for some drug that will gratify or meet his neurotic craving. The alcohol and the



# ACTUAL EFFECTS OF ALCOHOLIC LIQUORS ON THE HUMAN STOMACH AND KIDNEYS

## THE KIDNEYS

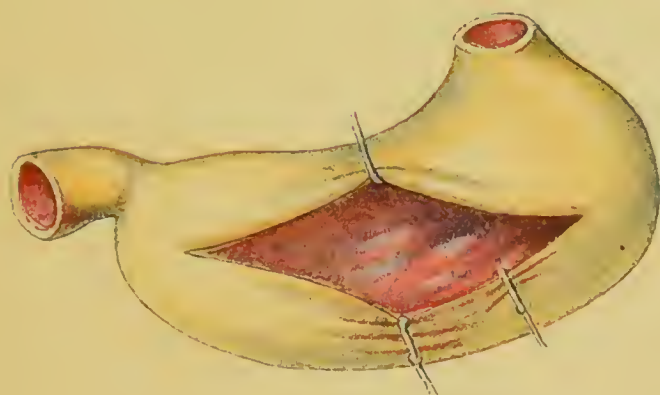


HEALTHY CONDITION



DISEASED FROM INTEMPERANCE

## THE STOMACH



HEALTHY CONDITION



DISEASED FROM INTEMPERANCE





opium habit to the inebriate are convertible habits, and the inebriate, like a pendulum, will swing from alcohol to opium; not infrequently the two habits are combined, as in the form of tinct. opii, constituting a mixed habit, in which the effects of both alcohol and opium have to be considered. Occasionally a case is presented in which morphia is used hypodermically, and the alcohol used in the usual manner. In cases where opium addiction is associated with the habitual use of alcohol, the opium habit is of paramount importance and the alcohol assumes a secondary place.

The fact that opium can substitute alcohol is the keynote to many vaunted secret cures, in the so-called "narcotic treatment" for alcohol. It simply substitutes one habit for another, and as long as the victim is taking the so-called remedy he is reasonably comfortable. But I admit if the "narcotic treatment" was carefully practiced, in judicious hands it might, in conjunction with such other remedial measures as would best eradicate the primal causes of the inebriety, prove useful, if not curative, in cases of inebriety.

Are there any drugs that are specifically beneficial for the treatment of inebriety as such? We would state that drugs that act directly as a stimulant to the nervous system are of value. Strychnia is a type of this class of drugs, and one of the best of its class.

Luton, of Rheims, Belgium, was the first to point out its value in alcoholism. Then the Russians used it largely and it was known as the "Russian treatment," and finally, the Americans adopted its use in such cases.

Strychnia has proved serviceable as both abortive and curative in acute alcoholic delirium, as well as useful in the more chronic forms of alcoholism. It seems to be tolerated in such cases — in cases of alcoholic poisoning under normal conditions, we have no record of the value of strychnia as an antidote; interesting experiments might be made on the lower animals with the view of determining this point. Strychnia is an excellent cardiac tonic, and one of the best respiratory stimulants, and might be used in general medicine in cases in which alcohol is oftentimes prescribed.

Oxide of zinc, during the past twenty years, has been used with advantage in cases of chronic alcoholic intoxication.

Quinine has been used more particularly in the later or convalescent period of the treatment of alcoholism.

The so-called "Red Cinchona Cure" for a time interested the public. Rational medicine does not recognize any special drug or specific remedy as a universal cure for inebriety, nor does clinical experience form any basis for such a claim. From the very nature of the case, such a remedy would be impossible. The ætiology of inebriety is dependent on such a variety of causes and its environments and complications so numerous that any one remedy could not fulfill all, or even meet the more important of these conditions. However valuable drugs may be to meet certain indications in the various conditions incident to inebriety, we believe that so far as the curative

treatment of inebriety is concerned, drugs must assume a secondary place, valuable as they may be in their respective spheres.

In the treatment of the alcohol habit we place first: *Restraint and seclusion in a special asylum for a definite period, and total abstinence during this period.*

In a few words, concisely expressed, this statement includes the plan now adopted by the leading asylums of this country and of Europe for the recovery of the inebriate. It involves restraint, (legal, if need be), seclusion, a special institution, in which all the latest and best methods of dealing with the inebriate are procurable, a sufficient period in which to apply these measures, and we need hardly add, a long period of total abstinence from all alcoholic liquors. We need hardly add that diet, rest, recreation, hygienic surroundings, and the exhibition of appropriate drugs are all included in the above plan.

The causes of degeneration being removed, the factors of regeneration being brought into action, new formation of nerve, muscle and tissue must supplant degenerated tissue, if haply organic disease has not resulted in irreparable injury.

We have hinted at an hysterical element in the history of inebriety. The inebriate, whatever may be his condition, is largely influenced by his surroundings.

In the light of such an hysterical element in the clinical history of inebriety, we can readily account for the apparent success of the so-called temperance movements that sweep over communities periodically and effect many apparent cures, or rather, in the language of the day, reformations. Such an element will also explain why, after such a tidal wave of excitement, relapses take place oftentimes in large numbers, and the period of excitement is followed by a period of reaction.

The occurrence of relapses is readily accounted for by the fact that the stimulus of the period of excitement buoys up the inebriate for the time being, during which strong mental emotion is a powerful factor. He is keyed up, as it were, for the time, and sustained by a moral stimulus. When this is withdrawn, reaction, followed by corresponding depression, sets in, and the old method of stimulation is again imperatively demanded and yielded to.

Why some inebriates go through such a period of excitement and do not relapse, and why others do, can be accounted for by the fact that the former are in a reasonable degree of physical health, and are not burdened, dragged down and handicapped, either by disease that is non-alcoholic, or that is the result of alcoholic degeneration. The inebriates so affected are not influenced, or if at all, only temporarily, by the so-called "temperance revivals" that appear and disappear with almost stated regularity in large and small communities, and we must add do good, but only in the channel indicated.

It is also operating through this hysterical feature of inebriety



that charlatanism may effect a temporary, possibly a permanent success in a certain class of cases.

In cases where the hysterical element largely preponderates, we believe psycho-therapeutical agencies, or even those that appeal to purely mental conditions, will be of service, but they will not cure a cirrhotic liver, lung, or kidney, or remove the physical causes upon which the inebriety may depend. In addition to those measures that appeal to the higher moral nature, there ought also to be combined such as meet certain intelligent wants. To this end all reasonable amusements, entertainments, and especially such occupations as will interest the person and keep him busy, should be encouraged, if not made compulsory.

Incidentally I may mention hypnotism as having been used especially by French physicians, with some benefit in cases of chronic alcoholism. I have no data to give, and have not had any personal experience with it.

The Bi-Chloride of Gold cure, known as the Keeley cure, is in many cases successful, but not in all. Would advise its use as a last resort; though we think its use sometimes leads to insanity and suicide. It cures at all events for the time being.

If the temperance advocates would supply light, warm, cheerful places of resort with hot and temperance drinks, supplied with pool and billiard tables where the poor could spend their evenings and meet each other and amuse themselves at a reasonable expense, and establish cooking schools for the wives where they could learn how to cook nourishing and palatable food which would supply the body with the nourishment which it must have and requires, we believe it would do more towards temperance than all the laws that could be passed.

Many prominent physicians who have made alcoholism a specialty, strongly recommend the immediate withdrawal of all liquors, and isolation from all company where habits and influence would lead to temptation, taking the following prescription faithfully for three or four months:

Sulphate of magnesia	. . . . .	one teaspoonful.
Nitric acid	. . . . .	" "
Sulphate of iron	. . . . .	" "
Powdered cinnamon	. . . . .	" "
Sugar of milk	. . . . .	three teaspoonfuls.
Distilled water enough to fill a six ounce bottle.		

One teaspoonful frequently when the crave is on, and in a wine-glassful of water.

Cold sponge bath also should be taken once or twice a day.

### **Enlargement of the Brain. — *Hypertrophy.***

THIS is chiefly a disease of childhood. It consists in an unnatural growth of the brain. Sometimes the skull grows with it, and there may not be any, or only slight, symptoms of disease.

The complaint is sometimes congenital,—the child being born with a head far above the natural standard of size. Sometimes a child's head, from this disease, will reach the size of an adult's by the time it is five or six years old. This is not necessarily a *disease*, though children that suffer from it are very apt to die finally of some affection of the brain.

**Symptoms.**—Dullness of intellect, indifference to external objects great irritability of temper, inordinate appetite, giddiness, and an habitual headache, which at times is very severe. In addition to these, there are, at times, convulsions, epileptic fits, and idiocy. There is a peculiar projection of the parietal bones, which serves well to distinguish this disease from acute hydrocephalus.

**Treatment.**—As far as possible, suspend and repress all exercise of the mind. Take the child from school as soon as the disease is discovered, and put it to the most active muscular exercise in the open air. The moment there is any excitement of the brain, or heat on the top of the head, apply cold water, ice, or cold evaporating lotions. If, as the child grows up, the signs of mischief increase, the diet must be simple, and carefully regulated. Bread and milk only is sometimes advisable.

### Shrinking of the Brain.—*Atrophy.*

THIS is a disease in which the volume of the brain is diminished. There are two forms of it; one is congenital, the brain not being properly developed at birth; the other occurs in consequence of disease either in the membranes or the arteries. The symptoms are not distinguishable during life from those of other brain affections, and therefore it can only be treated according to general principles.

### Water in the Head.—*Acute Hydrocephalus.*

THIS, like enlargement of the brain, is likewise a disease of childhood, and often attacks *scrofulous* children.

Being an inflammatory disease, it is important to have early notice of its existence, and, if possible, to be aware of its *approach*; which we may be, frequently, by observing the following *premonitory*

**Symptoms**; namely, a disturbance of the digestive functions, indicated by a capricious appetite,—the food at one time being disliked, at another devoured greedily; a foul tongue, offensive breath, enlarged and sometimes tender belly, torpid bowels, stools light-colored from having no bile, or dark from vitiated bile, fetid, sour-smelling, slimy and lumpy. The child loses its healthy look, and grows paler and thinner. Its customary spirit and activity are gone; it is heavy, languid, dejected; it is fretful, irritable, uneasy; and sometimes is a little tottering in its gait.

After these warning symptoms, the disease may begin in one of three ways:—



The pains in the head become more severe and frequent, and are sharp and shooting, causing the little patient to wake and shriek out. As the drowsy state advances, the shrieking gives place to moaning. Beside these symptoms, there are stiffness in the back of the neck, pain in the limbs, great tenderness of the scalp, vomiting, sighing, intolerance of light, knitting of the brows, increased disturbance of stomach and bowels. This stage may last ten to fourteen days, the child growing more weak and peevish.

Another form of attack is marked by acute pain in the head and high fever, convulsions, flushed face, brilliant eyes, intolerance of light and sound, pain and tenderness in the belly, stupor, great irritability of stomach, causing retching and vomiting upon every attempt to sit up in bed.

The third mode of attack is very insidious, — the early symptoms being mild and hardly noticeable, or not even occurring at all. In such case, the convulsions or palsy come suddenly, without notice, bringing swift and unexpected destruction. This has sometimes been called *water-stroke*.

**The First Stage** is the period of *increased* sensibility and excitement, caused by inflammation, in which the pulse is quick and irregular.

**The Second Stage** is one of *diminished* sensibility, or lethargy, during which water is effused upon the brain, and the pulse is slow.

**The Third Period** is one of palsy and convulsions, with squinting of the eyes, rolling of the head, stupor, and a rapid, thread-like pulse.

**Treatment.** — The first or inflammatory stage of the fever is very important, and must be controlled for five or six days. Scammony and croton oil (33) may be chosen for this purpose. Apply cold water, ice, etc., to the head. Use tinct. veratrum viride or (355).

In the second stage, put blisters upon the back of the neck, and one upon the bowels if they are very tender.

In the third stage, effusion having taken place, use the warm bath, or the vapor bath, — also digitalis, squills, and iodide of potassium, (144), (128), (302), (130). The effusion, if permanent, may be drawn off.

Confine the child to a darkened room, of moderate temperature, — excluding all noise and causes of excitement, and let him lie upon a hair mattress, with his head somewhat elevated.

**Diet.** — Gruel only during the stage of excitement, — during that of collapse, it should be nourishing, but mild and easy of digestion, as beef tea, plain chicken or mutton broth, and animal jellies. At the same time, support the patient by the cautious use of the aromatic spirit of ammonia, ten drops every four hours, valerian, wine whey, and infusion of gentian, columbo. or quassia, (64), (66).

### **Dropsy of the Brain.**—*Chronic Hydrocephalus.*

*Acute* hydrocephalus is an *inflammation*; *chronic* hydrocephalus, now to be considered, is a *dropsy*. It often begins before birth. It consists in the accumulation of enormous quantities of water within the brain, sometimes within its ventricles, at other times upon its surface. When it occurs soon after birth, it advances slowly and imperceptibly, — the enlargement of the head being the first thing noticed.

The skull being tender in infancy, it separates at the fontanelles, as the fluid accumulates, and the head, at times, attains an enormous size, — so great that the child cannot carry it upright, but lets it droop laterally upon the shoulder, or forward upon the breast.

As the disease advances, the senses become blunted, the child is deaf or blind, the intellect is weakened, perhaps idiocy appears, the flesh and strength pass away, convulsions and paralysis come in their turn, and a stupor is apt to occur which ends in death.

**Treatment.** — The remedies may be external, or internal, or both.

**Internal Remedies.** — These should be purgatives (33), (31), or diuretics and alteratives (302), (145), (144).

**External Remedies.** — Apply an ointment of the iodide of potassium to the scalp every night (185). A tight bandage applied over the whole head will sometimes have a favorable effect. Another expedient is to puncture the skull and draw off the water. Tapping the brain has effected a cure in many cases, and perhaps promises the most relief of any remedy we have. In newly-born children with this affection, it is the best means.

As may be expected, none of these remedies are likely to give the benefit desired, and an operative interference above proposed constitutes a risk which it is perhaps better to run even if it results in the death of the child, rather than have it become a hopeless invalid with epileptic convulsions and the other manifestations of an impaired brain.

### **Cerebro-Spinal Fever.**

**Definition.**—This disease may be contracted by poisoned air and through the medium of fluids, and though markedly infectious, is not supposed to be contagious. The other names are spotted fever or cerebro-spinal meningitis. The disease is found among children and young adults more often than among the aged. It occurs suddenly in epidemics which cover a large territory and it does not appear to be referable to any known laws or atmospheric conditions. The death rate is exceeding high considering the number that have the disease, and this rate varies during different epidemics although there are different forms of severity.



**Symptoms.**—As a general rule the first symptoms are intense headache with pain in the back of the neck or through the extremities and chest, followed by a moderate fever without sweating. Vomiting, and delirium with convulsions are common symptoms. In a small portion of the cases, under fifty per cent, an eruption occurs, which gives the name of Spotted Fever to the disease. The bending back of the head on the neck making it impossible to bring the head forward is known as retraction of the head and is a very common symptom. Deafness, blindness and other complications are the result of irritation of the nervous system. The disease may be mistaken for typhoid fever early in its course, though the bowel symptoms in the latter disease are much more prominent.

Herpes or cold sores on the nose and lips are common in meningitis and very rare in typhoid.

**Treatment.**—Cold to the head by means of ice bag should be at once resorted to. The diet should be light and sedatives such as the bromide of soda or chloral in 20 grain doses by the mouth and even morphia in one-fourth grain doses will be needed to relieve and quiet the nervous irritation.

### Diseases of the Spinal Cord.



FIG. 84.

THERE are few diseases more interesting, as a study, than those which affect the nervous cord which runs through the centre of the back-bone. This cord is a continuation, an appendage or tail of the brain. (See Figure 84.) It is the seat and centre of certain nervous functions, called *reflex*, by which so many movements take place which are not under the control of the will.

In order that we may feel what takes place in any part of the body or limbs, and that the will may have power to move such part, it is necessary that nervous matter should be continuous and unbroken between the part in question and the brain.

If the spinal cord be cut, broken, or crushed at any point, all those parts which receive nerves from *below* the injury, lose their power of motion and their feeling. When the injury is in the upper part of the cord, the breathing and the circulation will stop, and death is the immediate consequence. If the middle portion of the cord be the seat of the injury, the bowels and other organs may lose their motion and feeling; if the lower portion, then the lower limbs only will be the sufferers.

Disease or injury in the upper part of the cord is therefore much more dangerous than the same thing occurring in the lower.

## Inflammation of the Spinal Cord.

THE membranes which surround the cord may be inflamed just as those are which enclose the brain; but as the cavity running through the spine is quite small, there cannot very well be inflammation of the membranes without its involving the cord at the same time.

**Symptoms.** — Pains, often intense, running along the spine, extending out into the limbs, and made worse by motion. They are similar, in some respects, to rheumatic pains. There is rigid contraction, and sometimes violent spasms of the muscles of the back and neck, — so great, at times, as to bend the body back into the shape of a hoop; also a feeling of constriction in various parts, as if they were girt by a tight string; a sense of suffocation; retention of urine; a most obstinate constipation and frequent chills or rigors. The pain which is felt along the cord is aggravated by rapping upon the spine, but not by pressure.

The above symptoms are supposed to be the result of inflammation predominating in the membranes. When its seat is more particularly in the substance of the cord, the symptoms are, — convulsive affections of the head and face, inarticulate speech, loss of voice, squinting, and difficulty of swallowing, if the extreme upper part of the cord is inflamed; if the disease be slightly lower, difficulty of breathing, irregular action of the heart, and tightness of the chest; if lower still, vomiting, pain in the belly, sensation of a cord tied round the abdomen, pain and heat in passing water, retention of the urine, inability to retain the urine, desire to go to stool, or involuntary stools.

Spasm and stiffness, then, are the results of inflammation of the membranes; convulsions and palsy, of the same affection of the cord.

**Treatment.** — When the inflammation is acute, apply a few leeches or wet cups along the sides of the spine. In chronic inflammation, powerful friction, or mustard draughts, stimulating liniments (190), or plasters, will generally answer the purpose.

## Apoplexy.

APOPLEXY is that condition in which all the functions of animal life are suddenly stopped, except the pulse and the breathing; — in which there is neither thought, nor feeling, nor voluntary motion; in which the person falls down suddenly, and lies as if in a deep sleep.

**Modes of Attack:** — There are at least three ways in which this terrible disease may make its assault.

**The First** form of attack is a sudden falling down into a state of insensibility and apparently profound sleep, — the face being generally flushed, the breathing stertorous or snoring, the pulse full and not frequent, with occasional convulsions.



From this mode of attack some die immediately, others get entirely well, and others get off with the exception of paralysis on one side, or the loss of speech, or some one of the senses.

**The Second** form of attack begins with sudden pain in the head. The patient becomes pale, faint, sick, and vomits, — has a cold skin and feeble pulse, and occasionally some convulsions. He may fall down, or may be only a little confused, but will soon recover from all the symptoms, except the headache, — this will continue, and the patient will sooner or later become heavy, forgetful, unable to connect ideas, and finally sink into insensibility, from which he never rises.

This mode of invasion, though not appearing so frightful as the first, is of much more serious import.

**In the Third** form of attack there is sudden loss of power on one side of the body, and also of speech, but not of consciousness. The patient retains his mind, and answers questions either by words or signs. This may be called paralytic apoplexy. The patient may either die soon, or get well, or live for years with imperfect speech, or a leg dragging after him, or an arm hanging useless at his side.

**The Persons Attacked** are apt to have large heads, red faces, short and thick necks, and a short, stout, square build, though it occurs often among those who are thin, pale, and tall. The tendency to it increases in advanced life.

**The Forerunners** of apoplexy are headache, vertigo, slight attacks of palsy, double vision or seeing two objects when there is but one, faltering speech, inability to remember certain words, sometimes a sudden forgetfulness of one's own name, a frequent losing of the thread of ideas attempted to be pursued, and occasionally an unaccountable dread, for which no reason can be given.

**Exciting Causes.**— Whatever hurries the circulation of the blood, as strong bodily exercise, is an exciting cause. So are all those things which cause the blood to flow towards the head, as coughing, sneezing, laughing and crying, straining at stool when costive, lifting heavy weights, singing, and playing on wind instruments. To these may be added, exposure to the sun, the bad air of crowded rooms, holding the head down, or turning it around to look backward, tight cravats worn about the neck, and exposure to severe cold.

**Treatment.**— If the patient have the appearance of suffering from fulness of blood in the head, as evinced by redness and turgescence of the face and throbbing of the temporal arteries, and if the pulse be full and hard, feeling like a tense vibrating rope under the finger, place him in a half-recumbent posture, with his head raised; loosen his clothes, particularly his neck-cloth and shirt collar, and whatever may press upon the neck, and then as quickly as possible apply cold wet cloths to his head, changing them often. Ice is still better, if a

may be had. Apply wet cups to the nape of the neck, and mustard draughts to the soles of the feet,—at the same time applying tight ligatures around the limbs, to prevent the blood from returning rapidly in the veins. The ligatures should be gradually removed when the patient recovers his consciousness. Also administer a stimulating, purgative injection (246), and place two drops of croton oil, rubbed up with a little pulverized loaf sugar, far back upon the tongue. Repeat the injection every fifteen minutes, till the bowels are thoroughly moved. This is one of the few diseases suitable for bleeding.

If the patient be old, and the pulse small and feeble, with no fullness or beating of the temporal arteries, or swelling of the veins of the neck and forehead, the countenance being pinched, and the skin bloodless and cold, the cupping, purging, and applying the ligature must be omitted. In this case it will be better to apply warm flannels and hot bricks to the surface, and administer ammonia and camphor (283), (135) internally.

To prevent future attacks, gentle tonics should be used, and the skin should be kept healthy by daily bathing and friction. The bowels must not be permitted to become costive. The diet should be light, chiefly vegetable, and almost entirely so in hot weather. The food should be well chewed. The mind should be kept cheerful and hopeful, and free from great excitement. The sexual passion should be restrained, and very rarely indulged. Intoxicating drinks should be abandoned, if used, and all tight cravats be discarded from the neck. Direct rays of the hot sun in summer should be carefully shunned. No food should be taken for three hours before retiring, and a mattress only, of some degree of hardness, should be slept upon,—the head being always well elevated. To these precautions, I would add dipping the feet every night before retiring in cold water; and, if any tendency to cold feet be experienced, dusting pulverized cayenne in the bottoms of the stockings.

### **Sunstroke.**—*Coup de Soleil.*

Sunstroke results from the exposure of the body to excessive heat in the form of high temperature either of the sun's heat, from a furnace, or an exceedingly hot day from heat without direct exposure from the sun. There are two varieties, one known as heat exhaustion, where the temperature of the person's body is only slightly elevated, if at all, the other, and the more common one "heat stroke" or "sun stroke" in which the temperature of the body is raised many degrees. The symptoms are headache, dizziness and sometimes difficult breathing and thirst in the earlier stages, which if not recognized and means taken to prevent more serious troubles, at once go into unconsciousness, possibly accompanied by convulsions and spasms. If the fever cannot be reduced a serious condition occurs, followed probably by death inside of twenty-four hours. Even an improve-



ment may be followed later by a fatal meningitis. Persons who have once had sunstroke are also greatly afflicted by high temperatures which is intensified if the air is moist. It is needless to add a large portion of these cases die.

**Treatment.**—As is known the normal temperature is  $98\frac{1}{2}$  degrees and the bath is used to reduce the temperature as near this as possible. Strip the patient, lay him flat on the floor or low bed and if possible apply ice; ice water or even a stream of cold water from a hose may be applied over the body, but the circulation must be kept up by an attendant rubbing the surface of the body to produce reaction so that the cooling of the body will be general and not entirely on the surface, as the congestion of the body with heated blood which would be caused if the rubbing was omitted would kill the patient. Ice should be applied to the head by means of an ice bag or some other means. Constant care should be taken that these measures while strenuous, should not be carried too far when the temperature once begins to drop, as when once started the patient immediately goes into collapse from the fever dropping too rapidly. Heart stimulants such as teaspoonful of aromatic spirits of ammonia with twenty drops of compound spirits of ether or strychnia in one-thirtieth grain doses may be given to support the heart. Alcohol should be avoided as it will only increase the congestion in the head; some good cathartic, as citrate of magnesia, should be given and the headache which often follows may be relieved by a twenty-grain dose of bromide with five grains of phenacetine added; the recurrence of high temperature should be watched for as it very often occurs, when cold baths will be again required, as a relapse is not at all uncommon.

### **Palsy. — Paralysis.**

PALSY is a loss of the power of voluntary motion and feeling, one or both coming on, sometimes gradually, but more often suddenly, and extending at one time to a part, at another time to the whole body. It is a kind of station-house on the way to apoplexy, where passengers stop, not merely to stay over night, but to rest many days, or even years.

A great injury inflicted upon the brain, either by pressure or other cause, will induce a complete loss of motion and feeling, and this extending to the whole structure, brings likewise a loss of consciousness, which is apoplexy. A smaller degree of pressure, or a less injury upon the same brain, would occasion a loss of motion only, or, if a loss of feeling were experienced also, it would only extend to a part of the body, and consciousness would remain. This would be palsy. The disease is like apoplexy in kind, but stops short of it in degree.

### Paralysis of One Side of the Body.—*Hemiplegia*.

WHEN palsy affects an entire half of the body, dividing it through the centre of the face, neck, body, etc., from head to foot, it is called *hemiplegia*. It is more nearly allied to apoplexy than any other form of the disease, and is generally ushered in by pretty well-marked apoplectic symptoms.

**Symptoms.**— Sometimes there are no premonitory symptoms ; but often before the attack there are flushed face, swelling of the veins about the head and neck, vertigo, a sense of fullness, weight, and sometimes pain in the head, ringing in the ears, drowsiness, indistinct articulation of words, or even loss of speech, confusion of mind, loss of memory, and change of disposition, — amiable persons being made sullen and peevish, and irritable ones mild and simpering. After the attack, the countenance generally acquires a vague expression ; the mouth is drawn to one side ; the lower lip on the palsied side hangs down, and the spittle dribbles away. The speech is altered, and the mind is generally impaired.

In some instances, the patient recovers in a longer or shorter time ; in others, little or no improvement takes place, and the patient, after remaining helpless, often for a long time, dies either from gradual exhaustion, or suddenly from apoplexy.

**Causes.**— Hemiplegia and paraplegia are caused by pressure upon the brain, by the effusion upon it of blood or water, by a tumor, by mechanical injuries, by the striking in of eruptions, and by intemperance in eating and drinking. Paraplegia often results from disease or injury of the spinal marrow.

**Treatment.**— In so many cases does the administration of iodide of potash give greater or less relief to different diseases of the brain resulting in paralysis that its use is recommended. It must be persisted in for weeks and months. The doses need not be excessive, and five to ten grains in a half glass of water or milk a day and continued some time will often be followed by improvement. There are other preparations of similar nature recommended from time to time but all depend upon the amount of iodine which can be absorbed by the system.

### Paralysis of Lower Part of Body.—*Paraplegia*.

THIS form of palsy divides the body *transversely*, at the hips, and confines itself to the lower extremities, and to the parts about the pelvis.

**Symptoms.**— When it arises from affections of the brain, it is attended by pain in the head, giddiness, drowsiness, dimness of sight,



and impaired memory. Numbness is sometimes felt in the upper extremities as a forerunner of this form of palsy. At first there is a slight stiffness and awkwardness of the motion of the legs, which continue to increase till a cane is needed to balance the body and make it steady. From a paralysis of the neck of the bladder, the stream of urine grows more feeble, and finally dribbles away involuntarily. The bowels are for a time costive, but when the circular muscle which closes the fundament becomes palsied, the feces pass without consent of the will.

When disease of the spinal cord is the cause of the complaint, it is apt to come on gradually; languor and weakness are felt in the knees, the legs are not easily directed in walking, — being thrown across each other, causing tripping and stumbling. By degrees the loss of power increases in the thighs and legs, until at length the whole lower extremities become palsied and useless.

### Local Palsy.

PALSY is called *local* when it is confined to a single limb, or muscle, or locality. One of these forms is called *facial* palsy. It affects one half the face only, and is a good specimen of these affections. It removes all power of expression from one half of the face, and leaves the features still, blank, and unmeaning. With the affected side of the face, the patient cannot laugh, or weep, or frown, or express any feeling or emotion, while the features of the other side are in full play. Among the ignorant, who do not comprehend the extent of the evil, the drollness of the expression excites laughter.

### Shaking Palsy.

THE nature of this form of palsy is well expressed by its name.

**Symptoms.**— The first symptom of this complaint is a weakness and tremor of the head or hand. In about a year the other hand, or the lower extremities become affected; and the patient begins to lose his balance in walking. Then the trembling becomes perpetual; no limb or part remains still. Reading and writing are no longer possible, and the hand cannot even carry the food to the mouth. The balance cannot be maintained in walking; there is a tendency to fall forwards, and to avoid it, the patient is obliged to run or move quicker, and upon the toes.

At a later period, the tremor continues during sleep; there is increased weakness; the body is bent forward, the speech becomes indistinct, swallowing difficult, and the bowels torpid. At last the urine and feces pass involuntarily, and delirium and coma bring life to a close.

### Lead Palsy.

IN this disease the muscles of the forearm are palsied, so that the wrists "drop," as it is said, and the hands hang down when the arms are stretched out. It is caused by the gradual introduction of lead into the system. It is a disease, therefore, peculiar to painters, — particularly those who use carbonate of lead, or white lead, as it is called. It is generally the sequel of painter's colic.

**Treatment.**— A sudden and severe attack of palsy requires the same treatment as apoplexy. When the bowels are obstinately constipated, they must be moved by scammony and croton oil (31), (32) and by injections (246).

When all the symptoms of determination of blood to the head have disappeared, and the disease has become strictly chronic, exciting remedies must be employed, as frictions, stimulating liniments, blisters, stimulating baths, cold affusion, and electricity. Among the internal remedies, strychnine has the best reputation (85), (86). The tincture of the poison oak is well recommended (284). An alterative (145) should likewise be used.

Apply counter-irritants along the track of the spine, such as blisters, the moxa, the compound tar-plaster, and the pitch-plaster.

At first the diet should be light; but after the more active symptoms have disappeared, it should be nutritious, and sometimes stimulating. Flannel underclothes should always be worn next the skin.

For lead palsy, the best remedies are iodide of potassium, or sulphuret of potassium. The dose of either of these is from three to ten grains, three times a day, dissolved in water, one ounce of the salt to six ounces of water, and taken in simple syrup. The affected limb should also be soaked an hour each day in a gallon of water, with half an ounce of sulphuret of potassium dissolved in it.

### Hydrophobia. — *Rabies.*

THE bite of the mad dog, or mad wolf, or other hydrophobic animal, is the most dangerous of all poisoned wounds, because it is apt to be followed by a disease for which there is no certain remedy. Fortunately, the human subject is not as susceptible to the effects of the poison as some of the lower animals; for only about one-tenth of those bitten are attacked by hydrophobia.

**Symptoms.**— The interval between the bite and the appearance of the disease varies from twelve days to two months. The wound heals like any other bite of a similar animal. After a time, the scar begins to have darting, lancinating pains, which, if it be a limb that was bitten, run up towards the body. Sometimes it feels cold, or stiff, or numb, or becomes red, swelled, or livid, and occasionally breaks open, and discharges matter. The patient feels a strange anxiety, is depressed in spirit, has an occasional chill, and disturbed



sleep, and spasmodic twitches. The pulse is above its natural state, both in quickness and strength, and the nervous system is very impressible. The senses are all more acute; trifling noises produce agitation, and the eyes are so disturbed by the light that the patient sometimes hides himself in a dark place. The appetite is lost. This is the first stage.

Thirst now appears, and he attempts to drink. But the moment water approaches his mouth, a spasmodic shudder comes over him; he pushes it back with horror; the awful fact of his condition flashes upon him; and he cries out, "What I have dreaded has come upon me."

Thenceforward he can swallow no fluids; complains of pain and stiffness about his neck; is thrown into convulsions by the sight of water, or even the sound of liquids agitated in a vessel, or by a breath of air blowing upon him, by a bright light, or by the glare of a mirror. His throat is full of a viscid, glary matter, which he continually tries to clear away. Thus, between convulsions, in which he struggles, and sometimes strives to bite his attendants, and comparative stillness, during which he suffers great depression of spirits, he passes three or four days, and then dies either in a spasm, or from exhaustion.

**Treatment.**—Immediate suction of the wound, with care being taken that the person whose lips are used has no abrasion or wounds there, followed by disinfection is certainly the best method, if resort cannot be had to some of the institutions where Pasteur injective treatment can be utilized. Disinfection may be carried out if the wound is a torn one, not a narrow and deep one, or in the latter case it would probably be better to cut away enough flesh so that the disinfectant may reach the bottom of the wound. The use of corrosive sublimate in the strength of one part to 500 of water applied to the wound for five or ten minutes and then a poultice of weak solution of one part to 3,000 of water applied and bound on. The corrosive tablet sold at all drug stores contains about 7 grains of poison, and dissolving one of these in a half pint of water makes a strength of one to 500; a strength 1 to 1,000 may be made by dissolving one tablet in a pint of water.

Some of the Western physicians declare the red chickweed, or scarlet pimpernell, to be an absolute remedy for this disease, and cite some quite remarkable cases of its success. Four ounces of this plant, in the dried state, are directed to be boiled in two quarts of strong beer or ale, until the liquid is reduced one half. The liquid is to be pressed out and strained, and two drams of laudanum added to it. The dose for a grown person is a wine-glassful every morning for three mornings. A larger dose is required if the disease have begun to show itself; and if the case be fully developed, the whole may be taken in a day. The wound is to be bathed with the same decoction. The medicine, it is said, produces profuse sweating. It is worth a trial.

Considerable has been said of late of a remedy used in some parts of Europe, and said to be effectual. It is the "golden cenotides" (*cetonia aurata*), or common rose-beetle, found in large quantities on all rose-trees. A similar insect is said to infest the geranium-plant. When collected, they are dried and powdered; and given in this form, relieve excitement (so it is said) of the brain and nerves, and throw the patient into a sound sleep.

### Muscular and Nervous Derangements from Wounds.

IN some persons, a very small local injury will produce violent disturbance of the nervous system. Some will faint and be thrown into convulsions and vomiting from causes scarcely greater than the prick of a needle; and, before Morton gave the world the boon of ether, it was not very uncommon for persons to die under the knife of the surgeon. One of the most serious disturbances from wounds, of a nervous and muscular character, is

#### Locked Jaw.—*Tetanus*.

THIS is spasmodic contraction, with rigidity, or stiffness, of the voluntary muscles. Sometimes this rigidity is partial, at other times universal throughout the system.

Tetanus is produced by two causes, *exposure to cold* (idiopathic), and *bodily injuries*, particularly the *injury of a nerve* (traumatic tetanus). This last is the most frequent,—perhaps the only form of the complaint.

**The Symptoms** are long-continued, violent and painful contraction or cramp of the voluntary muscles. At first there is difficulty and uneasiness in turning the head, with inability to open the mouth easily,—then the jaws close gradually, but with great firmness; swallowing now becomes difficult, and a pain, starting from the breastbone, pierces through to the back,—probably caused by cramp of the diaphragm or midriff. The cramps now extend to the muscles of the body, the limbs, the face, the tongue, etc., which continue in a state of rigid spasm,—being swelled and hard in the centre,—till the disease yields, or the patient dies. At times the abdominal muscles are so tense as to make the belly as hard as a board. Occasionally the patient is drawn backward into the shape of a hoop, so as to rest on his head and heels (*episthotonos*); at other times he is drawn forward in the shape of a ball (*emprosthotonos*). All the contractions are attended with intense pain. It is the racking of the entire body with cramps like those which sometimes attack the calf of the leg. So violent are the contractions that the teeth are sometimes broken by them, and the tongue is often badly bitten. In the mean



time, the appearance of the sufferer is frightful. The forehead is wrinkled, the brow knit, the eye-balls motionless and staring, the nostrils spread, the corners of the mouth drawn back, the set teeth exposed, and all the features fixed in a ghastly grin.

The prevention of tetanus can be accomplished by thorough disinfection of all wounds, especially those due to gun-powder accidents and implements around stables and manure heaps.

In 1905 the number of cases reported following the July 4th celebration was 75 per cent. less than the previous year, owing to precautions taken. It is so fatal that somewhere about 70 and 80 per cent. of those who become affected die. The most valuable treatment is the injection under the skin by a competent person of the antitoxin of tetanus, but even this, to be successful, must be administered within a short time after the wound is made to prevent the poison from invading the nervous system and causing death.

**Treatment.**—At once upon the receipt of a wound which is suspicious the same treatment should be given as suggested for hydrophobia; on no account should the wound be closed over and allowed to heal in the early stages. If the disinfectants are not available it is much better to leave the wound exposed to the air, as the growth of these germs which is the cause of the disease is increased by exclusion of air. If the jaw becomes locked so that food cannot be taken, it may be necessary to feed the patient by means of a small rubber tube through the nostril or even the rectum, but a physician will, of course, have charge of the procedure. Ether and chloroform in desperate cases may be inhaled to ease the final struggle of the patient, or bromide of soda and chloral in large doses will also be useful.

### Epilepsy.—Epileptic Fits.

THIS disease has been sometimes called the *falling sickness*, but generally passes under the more vague title of *fits*.

**Symptoms.**—The disease is characterized by a temporary loss of consciousness, strong spasms and intervals between the fits. The attack is sudden, generally without warning, and attended with a loud cry, when the patient falls down, is senseless and convulsed, struggles violently, breathes with embarrassment, has a turgid and livid face, foams at the mouth, bites his tongue, has a choking in the windpipe, and appears to be at the point of death. Presently, in from five minutes to half an hour, and by degrees, these symptoms diminish, and at length cease; and the patient falls into an apparent sleep. In a short time more he recovers, and is apparently well. These attacks come again and again, and at irregular intervals.

This is the worst form of the disease; there is another class of cases in which the symptoms are much lighter,—there being no turgescence of the face, no foaming at the mouth, no cry, no convul-

sions; but merely a sudden and brief suspension of consciousness, a fixed gaze, a feeling of confusion, or a totter, from all of which the recovery is speedy.

**Causes.**—These are numerous,—as worms, disturbance from indigestible food in the stomach and bowels, difficult teeth-cutting, nervous irritation, either direct or by sympathy, sexual excesses and masturbation, disease or injury of the brain or spinal marrow, gall stones in the excretory duct of the liver, stone or gravel in the kidneys and bladder, fright, distress of mind, passion, great loss of blood, and many others.

**Treatment.**—But little can be done during the fit, except to protect the patient from being injured by the violence of the convulsions and especially for unusual accidents that may happen while the victim is falling unconscious, such as burying the face in the pillow at night, choking due to the food stopped in the throat or falling of the body on hard substances causing breaking of the bones, even fracture of the skull. There is little fear that death will result. Cures are seldom obtained but the violence of the convulsions may be greatly diminished by proper treatment and the time occurring between attacks of greater length. The most important drug and the one tried which has given the largest number of happy results is the bromide of strontium, which drug as well as any chosen must be used over a long period of time and even after the improvement has been noticed. The use of the drug must be continued even over a matter of years in the dosage of 10, 20 and even 30 grains well diluted with water, three times a day, and in all probability an improvement may be expected. If as in a certain proportion of cases an attack is preceded by a premonition of its onset, the inhalation of the vapor of nitrite of amyl which can be purchased in pearls, and crushed in a handkerchief, the attack can be prevented.

In all cases, indeed, the diet should be carefully regulated, being light, nutritious, and easy of digestion. The sleep should be taken at regular hours, and daily exercise in the open air be insisted upon. The bowels must be kept regular, by the food, if possible; if not, by mild laxatives. Apply along the spinal column 195, once a day, rubbing it well in; also, now and then, mustard poultices.

In addition to these remedies, give pills of iron and quinine (72). one after each meal,—also oxide of zinc (270), which is one of our very best remedies. Of the pills, one should be taken three times a day. Bromide of sodium, 1 dram in 24 hours, mostly at bedtime.

We can seldom go amiss in giving medicine calculated to relieve nervous irritation, and to build up the general system. For this purpose, the valerianate of quinine, and the extract of black cohosh (79) are well adapted. Citrate of iron and strychnine (316), is a very valuable remedy.

It is said that a black silk handkerchief thrown over the face of a



person in a fit, will immediately bring them out of it. It is an experiment easily tried; and having seen it in a respectable medical journal, I give it for what it is worth. The bromides in large doses, long-continued, sometimes cure epilepsy (367).

### Catalepsy. — Trance. — Ecstasy.

CATALEPTIC fits are simply what is known to all the world under the name of *trance*; and *ecstasy* is a modification of the same nervous disorder. It is a state in which the mind becomes so intensely absorbed in something outside of its earthly tenement, that it withdraws all control over the body, and all apparent connection with it, leaving it as if dead. There is a very light ticking of the heart, just perceptible to a cultivated ear, but the breast does not rise and fall with breathing, the features are all inexpressive and still, the eyes are wide open and motionless, apparently staring after the departed intellect; and the body and limbs are entirely passive,—remaining unmoved where they are placed by others, however tiresome and uncomfortable the position. In a word, a person in catalepsy is, in appearance, like a marble statue, or like a human body suddenly turned to stone, or, like Lot's wife, to a pillar of salt. There is as little feeling, or thought, or consciousness, as if the bowl had been instantaneously broken at the cistern, and the apparent death were real.

It is a peculiarity in this disease that the patient, on recovery from a fit, takes up the thread of conscious life just where it was broken by the attack. Thus, if she were lifting a cup of water to the mouth, she would hold it steadily, with the mouth open, till the return of consciousness, and then place it to the lips, as if no interruption had occurred; or, if conversing, and in the midst of a sentence, the unfinished words would be uttered at the end of the fit, even though it should last many days.

Persons in a cataleptic fit have much the appearance of one in the mesmeric state; and the statue-like position in which an attack fixes a patient, reminds one of the manner in which the psychologists, so called, will arrest a man under their influence, and make him immovable, with one foot raised in the act of stepping.

The disease attacks females much more often than males.

The premonitory symptoms are much like those of epilepsy, and the treatment should be about the same.

### Saint Vitus's Dance.—Chorea.

THIS disease is chiefly confined to children and youth between the ages of eight and fourteen. But few cases occur after puberty.

**Symptoms.**—The complaint affects mostly the muscles and the limbs. It excites curious antics,—such as we should suppose would occur if a part of the muscles of voluntary motion had hatched a mimic rebellion, broken away from the control of the will, and in

sheer mischief and wantonness, were tripping their fellow muscles, and playing tricks with the patient. A few of the muscles of the face or limbs begin their mischievous pranks by slight twitches, which, by degrees, become more energetic, and spread to other parts. The face is twisted into all kinds of ridiculous contortions, as if the patient were making mouths at somebody. The hands and arms do not remain in one position for a moment. In attempting to carry food to the mouth, the hand goes part way, and is jerked back, starts again, and darts to one side, then to the other, then mouthward again; and each movement is so quick, and nervous, and darting, and diddling, that ten to one the food drops into the lap. If the attempt be made to run out the tongue, it is snatched back with the quickness of a serpent's, and the jaws snap together like a fly-trap. The lower limbs are in a state of perpetual diddle; the feet shuffle with wonderful diligence upon the floor, as if inspired with a ceaseless desire to dance.

It is supposed by some that the disease consists in a partial palsy of a part of the muscles. The will in that case not being able to control the palsied muscles, when it commands the others to move, their action is not balanced, and they twitch the face and limbs into all the capricious and fantastic shapes we witness.

Others, and probably with more truth, hold that the seat of the disease is in the cerebellum or little brain. It is supposed to be one of the functions of this organ to preside over and regulate the locomotion,—that it holds the office of chief engineer, and that its duties are to keep the muscles in subjection to the will. The combined and consenting action of several muscles is needed for every movement. It is the business of the cerebellum to maintain this oneness of purpose and action—to see that no muscle flinches so as to disturb the harmony of the movement. When the cerebellum is diseased, all is confusion,—just as the locomotive runs from the track when the engineer is smitten with palsy.

The disease is not dangerous, but when it continues for many years it is apt to weaken the mind, and it sometimes very nearly destroys it.

**Causes.**—Whatever excites and weakens the nervous system, as powerful emotions of the mind, overworking the mind, reading exciting novels, eating too much meat, fright, striking in of eruptions, self-pollution, etc.

**Treatment.**—In the first place, remove all causes of excitement. Take the patient from school, and require some sort of cheerful outdoor exercise, daily. Take away all books, and be careful not to do anything to occasion anger or fear, or any kind of injurious excitement. Apply spinal ice-bags gradually and regularly.

In the second place regulate the diet—making it more animal and stimulating if it has been too low, and more vegetable and cooling if it has been too high.



In the third place, if the above changes have not been sufficient for the purpose, open and regulate the bowels with some gentle physic (30), (34) for a few days.

Iron in the form of tincture of the chloride of iron, 10 drops in water taken through a tube after meals, and arsenic in the form of Fowler's solution must be used for the anæmia, which is so often present. This latter drug is a strong solution of arsenic and must be used with great care, given in a dose for a young child 2 or 3 drops well diluted with water three times a day, gradually increasing a drop a day up to 8 to 10 drops three times a day, which is the maximum amount; it is not safe to increase more. The danger of poisoning must be looked for, such as a puffiness about the eyes and nose, or pains and cramps in the stomach. They show that the patient is getting a little more than is sufficient. The drug should then be cut down about half and continued at the last amount or entirely stopped. If there is a rheumatic history the salicylate of soda in 5 to 10 grain doses three times a day must be used. Next to arsenic, sedatives, such as bromide of soda or hyoscyamus or better than all the fluid extract of *cimicifuga* in the doses of half a teaspoonful diluted with water twice a day often proves a help.

To these remedies should be added the shower-bath, beginning with tepid water, and making it a little colder every day. If the shower-bath frightens the patient, or is not otherwise well borne, take the sponge bath.

### Chronic Chorea.

THIS can hardly be said to amount to a disease. It consists rather in uncouth tricks, arising from some slight disorder of particular muscles, and grown into a fixed habit, such as shaking of the head every three to twenty seconds, repeated squinting of the eyes in connection with a peculiar knitting of the eyebrows, wrinkling of the nose, shrugging of the shoulders, lifting the ears up and down, or even moving the whole scalp back and forth. These movements are commonly made without a consciousness of it; and generally there is no power to suspend them without a painful effort which cannot be easily continued.

No medical treatment is of any avail. These tricks can only be corrected by great watchfulness and effort on the part of the person suffering from them, and in many cases, not even by such means.

### Cramps.

CRAMP is experienced in the calves of the legs, the thighs, the stomach, the breast, the womb, etc. It is a very painful, sudden, and violent contraction of one or more muscles. The part is sometimes, as the phrase is, "drawn up into knots." When it attacks the stomach, it is a very dangerous affection. Women are subject to it about the third or fourth month of pregnancy.

They occur more frequently at night as the result of over-fatigue and indigestion during the day. These spasmodic contractions often occur in the abdomen and are accompanied by diarrhœa due to indigestion. Abdominal cramps are also a symptom of locomotor ataxia and other spinal diseases. The cramp of swimming is often due to an over-straining of some one group of muscles not hitherto much used, the sudden fatigue causing cramp. They may be also of nervous origin. Rheumatism is not infrequently the sole cause of painful muscular spasms.

**Causes.**— Drinking cold water when very hot and perspiring, exposure to damp night air, debility, indigestible food, and excesses in eating and drinking, and particularly over-straining the muscles.

**Treatment.**— Moderate the excessive labor and straining of the muscles which produce the cramps. When an attack occurs in the legs, tie a cord or handkerchief tight around the leg above the affected muscle. This will generally produce instant relief. Also briskly rub the parts with hot water, alcohol, ammonia, spirits of camphor, paregoric, or laudanum.

When it occurs in the stomach, apply warm fomentations, or what is better, a mustard paste (165). Take hot jamaica ginger or neuro-pathic drops. The bowels, if confined, should be opened with an injection.

Cramps of the limbs which afflict women in the family way, can only be mitigated, not cured, till after confinement. As a palliative, high cranberry bark, scullcap, etc. (87), will be found useful.

### Pain of the Nerves. — *Neuralgia*.

THIS disease affects one tissue only,—the *nervous*; and has one symptom,—*pain*.

In *apoplexy*, the nerves, rendered powerless and senseless by an external force, are like a man under a bank of earth which has slid down upon him. In *palsy*, they are suddenly bereft of feeling and motion by a blasting scourge within,—as one is smitten down by a pervasive charge from a magnetic battery. In *epilepsy*, the nerves are grasped and for a time held senseless by an unseen power, in which they struggle, as a man strives in the folds of the anaconda. In *catalepsy*, they are suddenly stiffened into senseless strings, for such automatic use as the bystander may, for the time, choose to make of them. In *chorea*, they are set to dancing by an invisible exhilaration, as a man is suddenly crazed by brandy.

In *neuralgia*, the nerves are neither crushed, nor collapsed, nor restrained for a time, nor stiffened, nor exhilarated. They simply have their sense of feeling intensely exalted; they are filled with *pain*. The pain is generally of a peculiarly darting, piercing character. The patient sometimes calls it tearing pain. It comes on in sudden paroxysms, with intervals of freedom between. The attacks are some-



times like an electric shock, and are so agonizing as to bring a temporary loss of reason. Occasionally there is great tenderness of the parts affected, and some fulness of the blood-vessels in the neighborhood; but generally the signs of inflammation are all absent, except pain.

Neuralgic pains occur in almost every part of the system. One of the most familiar forms of the disease is known under the name of

### Tic Douloureux.

It occurs in those branches of the fifth pair of nerves which go to the face. (See Fig. 85.) Sometimes one, sometimes all of the three branches are affected, but more often the middle branch only. When the upper branch is the seat of the disease, the pain is in the forehead, the brow, the lid, and sometimes the ball of the eye. The eye is generally closed during the pain, and the skin of the forehead is wrinkled. When the affection is in the middle nerve, the pain is preceded by a prickling sensation in the cheek, and twitching of the lower eyelid. Soon it spreads in quick and piercing pangs over the cheek, reaching the lower eyelid, the sides of the nostrils, and the upper lip. If in the lower branch, it sends its lightning shafts to the chin, the gums, the tongue and even up the cheek to the ear.

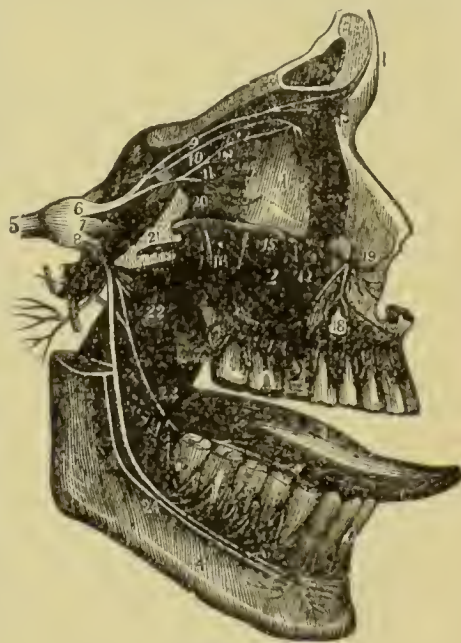


FIG. 85.

**Face-Ache.**—There is a species of nervous pain called *face-ache*, which does not quite amount to tic douloureux, but is nevertheless very afflictive. It occurs principally in the jaw, which seems to be filled with pain. No one spot seems to be more affected than another. From the jaw the pain often goes to the whole head, but it has not the stabbing intensity which generally characterizes neuralgia. It often proceeds from defective teeth.

### Hemicrania.

THIS is a neuralgic pain, confined to one side of the head,—generally the brow and forehead. Sickness of the stomach often attends it, and in many cases it is periodical,—coming on at a certain hour every day, and lasting a given time, and then passing away.

It may be caused by whatever debilitates the system, as hysterics, suckling an infant too long, or low diet. In fever and ague districts it is frequently produced by miasm. In many instances, the cause cannot be discovered.

### Sciatica.

THIS is a pain beginning at the hip, and following the course of the sciatic nerve. Occasionally it is an inflammatory complaint; sometimes is connected with an affection of the kidney; but frequently it is a purely neuralgic or nervous pain; and I have therefore thought it best to place it here, with nervous diseases.

Besides the various forms of neuralgia now noticed, the disease occurs, — sometimes with great severity, — in the female breast, in the womb, in the stomach, in the bowels, in the thighs, in the knee, and even in the feet. In many of these cases the disease is not where the pain is felt, but in the brain or spinal marrow, and consequently the true source of the complaint very often escapes detection. An excellent Episcopal clergyman in Northern New York, the Rev. M. B——, with whom I studied Latin and Greek preparatory to college, had a neuralgic pain in the knee so intense, persistent and exhausting, that the limb had to be cut off at the thigh to save his life.

**Treatment.**— This must be as diversified as the causes of the disease. For a general R use 368.

For tic douloureux, and some other forms, give internally, valerianate of ammonia (88); also 89, 90, 91, 92, 93, 316, and 84, as tonics.

For external use in tic douloureux, and other neuralgic affections, the prescriptions 188, 196, 197, 198.

For the face-ache, above mentioned, muriate of ammonia (134), in half dram doses, is a very valuable remedy.

When the disease is caused by miasm, and has a periodic character, like ague, it must be treated with quinine (67), (79), and if there be a low state of the blood, iron (72), (93) must be given at the same time. The galvanic battery often acts like magic in neuralgia.

The shower-bath, exercise in the open air, and whatever else will build up the general health, must be used according to circumstances.

Neuralgic pain of various kinds often yields readily to some one of the many coal-tar products like phenanthrene, antikamnia and ammonol: say 10 grains of either every two to four hours according to the intensity of the pain. The last named product is quite harmless and produces no numbness or faintness which is said to follow at times the use of some of the others.

Avoid rich or fatty foods. Live on a plain nourishing diet. Take exercise out of doors as much as possible.

### Derangement of Mind. — Insanity.

MOST writers on this disease have attempted a *definition* of it. I have never seen one which suited me. Here is mine. *Insanity is a wrench of man's nature, which sets his intellectual and moral faculties awry in their relations with the external world.*



In a state of mental and moral health, he looks straight at the outward world, and sees it *as it is*; insanity gives him an angular connection with it and he sees it *as it is not*; its objects have all changed their relative places; objects at the right in the panorama of life have moved to the centre, or gone quite over to the left; while things at the top have gone to the bottom, and those in the lowest places have taken the highest. With the thoroughly insane, *the world has gone back to chaos*.

These persons have their sensibility very much altered and perverted. Errors of the senses and illusions cheat them. In many cases, they cannot read because the letters are mingled in a confused mass. They often do not recognize their friends, and regard them as strangers or enemies.

They become awkward in the mechanical use of their hands, and their touch loses the power to correct the errors of the other senses. Hence they are cheated in regard to the size, form, and thickness of bodies.

They are haunted, at times, with smells which have no existence, and they hear voices distinctly speaking to them from clouds, or from trees; and these voices have the familiar tones of a friend, relative, or enemy.

The insane lose the power of comparing ideas. They associate things the most unlike, and often in a ridiculous way.

They also lose the control of themselves, and come under the dominion of their passions; and then they will do acts which they themselves disapprove. One of strict integrity, of unblemished morals, and of excellent standing, becomes insane, and immediately steals what he does not want, makes infamous proposals, and indecent gestures, and is in every respect the opposite of his past self.

The insane often become averse to those who were previously among the most dear to them. For acts of kindness, they repay abuse. They fly from their best friends. This is the result of their fear and jealousy; for they are very cowardly and jealous. This alienation from friends is almost a characteristic of insanity, and is one of its saddest features. The moral affections are always disordered, perverted, or annihilated in insanity. So much is this a leading feature of the disease, that it is only when the insane begin to recover their moral affections, when they begin to wish to see their children and friends, to fold them once more in their arms, and to enter the family circle and renew its joys, that we can count upon any certain signs of a cure.

The insane have a thousand strong fancies in regard to themselves. One thinks himself inspired of God, and charged with the conversion of the world; while another, equally sincere, believes the devil has entered into him, and that the pains of hell are already taking hold of him, and he curses God, himself, and the universe. Still another is the "monarch of all he surveys," and much more; he governs the

world, and directs the stars. One has all knowledge, and affects to teach the wisest. Another is proud, and withdraws from his fellows, bidding them not to come into his presence without proper acts of homage,—calling himself, it may be, a king.

There are five kinds of insanity. I will speak of each of them briefly.

### **Melancholy.** — *Lypemania*.

THIS is characterized by moroseness, fear, and prolonged sadness. The melancholic person is lean and slender, with black hair, and a pale and sallow countenance. His skin is brown or blackish, and dry and scaly. His physiognomy has a fixed appearance, the muscles of the face are drawn tight, the eyes are motionless, and directed to one point, the look is askance and suspicious, and the general expression is one of sadness, fear, and terror. He desires to pass his days in solitude and idleness. He walks as if aiming to shun some danger. His eye and ear are on the watch for evil.

These persons do not sleep much. They are kept awake by fear, jealousy, and hallucinations. If their eyes close, they see phantoms which terrify them.

Their secretions are disordered. The urine is either abundant and clear, or scanty and muddy. They sometimes retain their urine for days. One patient did not dare to make water lest he should drown the world, but was finally persuaded to it by the assurance that he would extinguish a fire which was devouring a city.

### **Insanity on One Subject.**— *Monomania*.

THIS is a chronic affection of the brain, not attended by fever, and characterized by a derangement of the intellect, the affections, or the will, upon one subject only. The patient seizes upon a false principle, and draws from it injurious conclusions, which modify and change his whole life and character. In other cases the intellect is sound, but the affections and disposition being perverted, their acts are strange and inconsistent. These they attempt to justify by plausible reasoning.

### **Mania.**

THIS is also a chronic affection of the brain, generally without fever. The countenance of the maniac is sometimes flushed, at other times pale. The hair is crisped; the eyes injected, shining and haggard. Maniacs dislike the light, and certain colors horrify them. Their ears are sometimes very red, and are disturbed by a tingling, and a rumbling sound. Noise excites and disturbs them. They suffer from false sensations, illusions and hallucinations; and their ideas come with great rapidity, and are confused and without order. Their



affections are in a state of turmoil, and their judgments are all erroneous.

Unlike the monomaniac, their delirium extends to all subjects. Their entire intellect, affections and will, are a chaotic wreck.

### Dementia.

HERE is another chronic affection of the brain, without fever, in which the sensibility, the intellect, and the will, are all *weakened*. Demented persons have not the power to concentrate their minds on anything, and can form no correct notions of objects. Their ideas float after each other without connection or meaning. They speak without any consciousness of what they are saying.

Many of them have lost their memory, or, like old persons, they remember nothing recent,—forgetting in a moment what is just said or done.

The demented have neither desires nor aversions; neither hatred nor love. To those once most dear to them, they are totally indifferent. They meet friends long absent without emotion, and part from their dearest ones without a pang. The events of life passing around them awaken in them no interest, because they can connect themselves neither with the past nor the future; they have no remembrances nor hopes. Their brain is inactive; it furnishes no ideas or sensations. They are no longer active, but passive beings; they *determine* nothing, but yield themselves to the will of others.

They have a pale face, a dull eye, moistened with tears, an uncertain look, and a physiognomy without expression. They sleep profoundly, and for a long time, and have a voracious appetite.

### Idiocy.

IDIOCY is in the condition in which the intellectual faculties have never been manifested. We are not to infer disease from it, any more than we infer it in the lower animals from the absence of intellect.

In idiocy there is no mind, because the brain is not large enough to be the organ of intelligence. It always dates back, therefore, to the beginning of life. Everything about the idiot betrays a defective organization. The demented person, the monomaniac, etc., once had intelligence; the idiot, never. They, in many cases, may be cured; he is hopelessly incurable. They had blessings which have been taken from them; to him, none were ever given. They were once the pride and hope of their friends; he, from his birth, was the smitten and blasted one of his family. He never reaches an advanced age,—rarely living beyond thirty years.

These remarks are sufficient to show the difference between idiocy and other forms of mental derangement. In the other forms of insanity there are brains enough, but they are *diseased*; in this there is no disease; the smallness of the brain is the primal and fatal defect.

This form of mental derangement is caused by a defective development of the brain. That the other forms are produced by *disease* of the brain, there can be no doubt.

Some have supposed insanity to be a *mental* disorder merely, having nothing to do with the body. They might as well suppose the delirium of fever to be a disease of the mind only.

Insanity is an unsoundness of the brain and nerves which proceed from it, in every instance. At first it is probably only excitement of the brain; but this, long continued, becomes a chronic inflammation. The brain and nerves of an insane person are undoubtedly sore, and hence the painful thoughts and feelings which afflict them. When the soreness is much increased, they are violent and furious; when it subsides, they are calm. In consequence of this inflammation and soreness of the brain, an insane person can no more think, or reason, or will, or feel correctly, than a person with an inflamed stomach can digest food well, or than one with inflamed eyes can see well.

**Causes of Insanity.**— Hereditary predisposition; painful subjects of thought or feeling long revolved in the mind; injured feelings which cannot be resented, mortified pride, perplexity in business; disappointed affection or ambition; great political, religious, or social excitements; sudden and heavy strokes of misfortune in the loss of property and friends; and in general, whatever worries the mind for a long time, and creates a deep distress, may be a cause of insanity.

But one of the most prolific causes, and worthy of special mention, is masturbation, or self-pollution,—a vice contracted by thousands of young people, both male and female.

Besides the above, I may mention several physical causes, as convulsions of the mother during gestation, epilepsy, monthly disorders of women, blows upon the head, fevers, loss of sleep, syphilis, excessive use of mercury, worms in the bowels, and apoplexy.

**Chances of Cure.**— Idiotism is never cured.

Melancholy and monomania are cured when recent, and do not depend upon organic disease.

Dementia is sometimes, though seldom, cured.

Chronic insanity, of long standing, is not easily cured.

Insanity which has been produced by moral causes, acting suddenly, is generally curable; if the causes have acted slowly and long, the cure is more doubtful.

Excessive study causes insanity which is hard to cure.

If caused or continued by religious ideas, or by pride, it is not often cured.

Insanity caused and maintained by masturbation is cured with great difficulty.

**Treatment.**— The treatment of the insane is now almost confined, as it should be, to public hospitals. In these institutions, all the means are provided which humanity has been able to devise, to lift



from these unfortunate beings the terrible shadow which is upon them. Here they have safety, comfort, recreation, friendly guardians, rest, and medicine.

They have safety from the annoyances which well-meaning but mistaken friends at home almost always commit in contradicting, and reasoning with, persuading, and threatening them; for only in these humane institutions has it been well learned that to do so is no wiser than to persuade, scold, or threaten a neuralgic pain in the face, an inflammation in the stomach, or a felon upon the finger. They are safe, too, from the impertinent scrutiny of neighbors, the hootings of unthinking boys in the streets, and especially from the causes, whatever they are, which have produced the disease. And so far, this is just the treatment they want,—no contradiction, no impertinent scrutiny from neighbors, no abuse in the streets, and a withdrawal of the causes which have produced the disease.

In these institutions, too, they have comforts. They have clean rooms, galleries, lodges, bathing-rooms, yards and gardens for exercise and walking, safe, quiet, well-aired bed-rooms, and clean and comfortable beds; cheerful dining rooms, and plain, wholesome, and nutritious food. And this, likewise, is the treatment they require.

They have recreation,—dances, cards, back-gammon, chequers, chess, billiards, nine-pins, walking parties, riding parties, gardening, and an indulgence in those arts of painting, music, drawing and architecture for which they may have a taste. And such recreations are powerful instruments in the cure of all disorders of the nervous system.

Here, too, they have friendly guardians, who have long studied their complaints, and have imbued their souls with a sympathy which goes down into the depths of their sufferings, and allies itself with all their sorrows;—men and women who are willing to act the part of guardian angels; to be their friends; who know how to gain their confidence; and who use the influence acquired by love, in leading them back towards health and happiness. And this, too, in curing the insane, is of great consequence, for none can do them good till they have their confidence, and this can be gained only by love and wisdom.

In these insane asylums, they find *rest*. When the brain is hot from inflammation, and they are raving from delirium, they are here withdrawn from the noisy crowd, and shielded from the rude shocks of the world. If need be, they are placed in solitary rooms, where silence spreads its soothing stillness through their excited brains. And it is of the greatest importance that the sore and torn feelings should rest; for rest allays excitement, and brings sleep; and without a proper amount of sleep recovery is not possible.

Finally, in these institutions, they receive the best *medical* treatment. They have warm and cold bathing, judiciously administered; they have simple cathartics when the bowels are bound, as salts, cas-

tor oil, and magnesia; tonics for debility, such as quinine, iron, casta, columbo, chamomile; and quieting medicines for their excitement, such as opium, morphine, cicuta, hyoscyamus, belladonna, stramonium, scullcap, and valerian. Prescription 74 is a combination much used. Here, too, broth, gruel, and milk, are administered by the forcing pump to such as take a fancy not to eat, — an expedient which has saved many lives. Fruits of all kinds, as strawberries, cherries, currants, plums, apples, peaches, and grapes, are allowed freely. Cold water, sweetened or otherwise, is the drink. To these things are added lively conversation, and whatever will divert the mind from reflection, and internal imaginings and revery.

Thus I have indicated, very briefly, the treatment which the insane receive in public institutions. That the chances of recovery in these humane retreats is much greater than at home, does not admit of a doubt. When it is not convenient to send an insane person to a hospital, the treatment should be as near like the one here sketched as circumstances will permit.

### Hypochondria.

THE common names of this disease are *low spirits*, *spleen*, *vapors*, *nypo*, and *the blues*. It produces constant fear, anxiety, and gloom. Business, pleasures, the acquisition of knowledge, and all the useful pursuits of life, become insipid, tasteless, and even irksome to the hypochondriac. His mind is full of the belief that something dreadful is about to befall him. He is either going to be sick, or to die, or lose his property or friends. He has no mind to engage in any business, nor does he wish to go anywhere, or to see anybody. Night and day his spirits are down to zero, and his heart has a load too heavy to bear. He is wholly occupied with his troubles and his feelings. He thinks he has various diseases, and wears out his friends by talking of his sufferings. He feels of his pulse often, looks at his tongue in the glass, and several times a day asks a friend if he does not look pale or sick.

The external senses manifest symptoms of derangement as well as the thoughts, feelings, emotions, and passions. There are roarings in the ears, like a waterfall, or the noise of a distant carriage. Floating black specks, or bright sparks, are seen before the eyes. These indicate a slight fulness of the blood vessels, and perhaps, in some instances, sparks of electricity passing to or from the eye, and are in no proper sense subjects for the alarm they cause. At one time the person will feel as large as a barrel, at other times not larger than a whip-stock; the head will feel light or heavy, large or small. The skin will twitch in different parts, or feel numb; or have the sensation of spiders crawling on it. The smell and taste become perverted; the hypochondriac will smell odors and flavors, at times, where there are none.



These errors of the senses are all owing to some slight disorder of the organs of sense; and they are no more wonderful than that the mind should perceive personal danger, poverty, and death itself, when none of these things are impending.

These persons are subject to fainting turns, when the breathing will appear to stop, the body become cold, the face pale; there will be distress in the region of the heart, which will apparently stop beating, and the person will feel as if dying. At the same time the mind will remain clear. These nervous spells are alarming, but pass off without danger.

These persons become changed in their moral dispositions. They are jealous, take a joke as an affront, and feel the greatest distress at any apparent lack of attention or neglect on the part of friends. They put the worst construction upon the actions of friends. They are irritable, fretful, peevish, and fickle.

The complaint is distressing, but does not appear to shorten human life.

The seat of the disease is in the brain and nerves. It is caused by anxiety, care, disappointment, working the brain too hard, diseases of the liver and stomach, costiveness, sedentary habits, excessive venereal indulgence, and masturbation.

**Treatment.**— This disease is more easily prevented than cured. It would be almost entirely prevented in this country if in childhood we were all taught to be contented with humble competence, to love active labor, and to think it honorable, instead of struggling after wealth, and falling into unhappiness when it does not come.

**Remedies.**— Of all the remedies for this complaint, that which is most important is active employment out of doors. The human body was made for motion. Without it the blood cannot be distributed to the several organs. The senses, — the eye, the ear, the touch, — should be much in communion with nature. In this way they are strengthened. Nature is their great physician. Man is a creature of sensation; and if too much occupied with feelings, thoughts, and deep reflections, the nerves will be irritated, and begin to give deceptive sensations. A very nervous man should fly to some active occupation, if he would be rid of suffering.

The open, fresh air is very important to restore the system to soundness.

Temperance, both in eating and drinking, will do much for this class of patients, yet they are the very persons who eat largely, and they often fly to the excessive use of stimulants to drive away their sorrow. By so doing, they aggravate the disease.

**Amusements** are very important for hypochondriacs. Lively company, cheerful and witty conversation, with mirth and laughter, lively songs and instrumental music, are all desirable; and so are gunning, fishing, riding, billiard-playing, and travelling.

Never allow these patients to be alone, and to have time to brood over their misery. See that they go early to bed, and rise betimes in the morning. The warm bath, the cold shower, or sponge bath, with brisk friction, are not on any account to be omitted. The diet should be light, nutritious, and generous; but fats, acids, liquors, and coffee, must be forbidden.

But little medicine will be required. If there be costiveness, let cracked wheat be eaten; if this does not answer, a little rhubarb and bicarbonate of potassa (35), or leptandrin, podophyllin, etc. (36), may be given as required by the symptoms. A teaspoonful of calcined magnesia once a day, or the infusion of thoroughwort, drank cold, will often answer an excellent purpose. A bowl of warm motherwort tea, with a teaspoonful of spirits of camphor in it will do well in fits of fainting when there is a sensation of dying. A teaspoonful of sulphuric ether may be given at the same time. If there be debility, tonics are sometimes useful (50), (49), (54), (55).

### Hiccough.—*Singultus*.

THIS is a sudden, jerking spasm of the midriff, occurring every few moments in bad cases, causing the air to be driven out of the lungs with such suddenness as to produce a noise something like the involuntary yelp of a puppy. It is generally caused by acidity of the stomach, which irritates the nerves distributed to its neighborhood, and is not difficult to remove; but when it occurs towards the close of some acute and grave disease, it is sometimes a sign that dissolution is at hand.

**Treatment.**—Startle the person suffering, by exciting surprise, or fear, or anger; or let a few small draughts of cold water be taken in quick succession; or, let the breath be held as long as possible. If the stomach is sour, take a teaspoonful of bicarbonate of soda, dissolved in half a tumblerful of cold water. To expel wind from the stomach, if it be present, take some warm aromatic essence of peppermint, ether, or compound spirits of lavender. But one of the most effectual remedies is *heavy pressure made upon the collar bones*. It is simple, and very effectual. Cocaine, one-eighth grain every fifteen minutes, is a very simple and often efficacious remedy.

### Fainting.—*Syncope*.

FAINTING is preceded by a distress about the heart, a swimming of the head, sometimes sickness at the stomach, coldness of the hands and feet, and a loss of sight, or *a sense of things growing dark*. The breathing diminishes, the pulse becomes small, the face deadly pale, and the patient wilts down, and becomes more or less unconscious of what is passing around.

Whatever causes debility, particularly of the nervous system, will



predispose to fainting. Persons much weakened by disease, faint easily, especially when they attempt to stand still. When on their feet, such persons should keep moving. Fainting is sometimes induced by sudden surprises and emotions, by violent pains, by the sight of human blood, and by irritation of the coats of the stomach by indigestible food.

**Treatment.**— Lay the patient upon the back, with the head low; let fresh air into the room instantly, and apply gentle friction. Sprinkle a little cold water upon the face, and hold spirits of camphor, ether, hartshorn, or vinegar to the nose, — rubbing a little of the spirits of camphor upon the forehead, and about the nostrils. As soon as the patient can swallow, give a teaspoonful of compound spirits of lavender, with ten drops of water of ammonia in it.

Persons subject to fainting should not go into crowded assemblies where the air is bad; neither should they wear tight dresses, or allow themselves to get excited. Cold bathing, a well-regulated diet, and vegetable tonics, will do much to break up the habit.

### **Dizziness of the Head.**— *Vertigo.*

THIS affection makes objects which are stationary appear as if moving, or as the phrase is, “turning round.” When seized with it, one will have a sensation as if falling, and objects about him will seem to be in motion.

It is caused by irritation of the nerves of the stomach in dyspepsia, by long application of the mind, by a weakened nervous system, by hysterics, and by a fulness of the blood-vessels of the head. When it proceeds from most of these causes, it is not dangerous; but when caused by impending apoplexy, it is a symptom of very serious import.

**Treatment.**— Find out the cause and remove that, and the dizziness will disappear. If it come from dyspepsia, eat lightly; if from costiveness, open the bowels either by coarse food, by daily cold water injections, or by some gentle physic. Avoid coffee, ardent spirits and late suppers, and take much exercise. Keep the feet warm, and the head cool. See to the liver and heart.

### **Disturbed Sleep.**— **Nightmare.**— *Incubus.*

IN this complaint the sleep is disturbed generally by some frightful image. Whatever of an alarming character is presented to the mind in sleep, causes fear, or some other painful emotion, the same as when awake. And when the attempt is made to resist, or to flee from the danger, it is ineffectual, because the muscles are locked fast in sleep. The fear being increased by the inability to escape, the sleeper makes all sorts of horrible noises, indicating distress of mind. The danger seen is as real to the sleeper as if he were awake, and he

tries to do just what he would if awake. Sometimes the sensation is that some heavy weight, or perhaps some horrible monster, is upon the breast, nearly pressing the breath out of the body.

At times, the power of motion is not absent, and then disturbed dreams may cause one to talk, or to rise and walk, or run. Children will laugh or cry, or scream, which shows that their minds are agitated by different passions. Persons who indulge gloomy and troublesome thoughts in their waking hours are apt to be disturbed with sleep-walking, sleep-talking, and frightful dreams, as of falling down precipices, during the hours for repose.

There is nothing very wonderful about these disturbances of sleep. It is only necessary that there should be an unusual sensitiveness of the brain, or that a hearty supper, eaten late, should irritate the nerves of the stomach, and that distressing thoughts should be dwelt upon during the day and evening, in order to produce all the walking, talking, dreaming of hobgoblins, shipwrecks, fires and polar bears, which distress so many unfortunate sleepers.

In night-walking there is simply a little more wakefulness than in night-talking, and in this latter, more than when one falls from a high place, and in this perhaps slightly more than in real *incubus*, when one is in the greatest peril, but cannot move at all.

**Treatment.** — When sleeping persons groan, or make any noise indicating nightmare, *shake them*, and they will come out of it at once. As these troubles are often caused by a weakened state of the nerves, much out-door exercise should be taken. The diet should be simple, and well regulated. The suppers should be light, and never taken late. The evening should be spent in some pleasant amusement, which will drive away care; and the last hours of wakefulness be occupied with pleasant reflections. One afflicted with nightmare should not lie upon the back, nor with the hands over the head. Acidity of the stomach, and costiveness, if they exist, should be removed by neutralizing mixture.

## Headaches.

THESE are not always caused by disorders of the brain and nerves, but they frequently are, and this seems the proper place to speak of them.

It is unwise ever to neglect headaches. They are sources of great suffering, and often lead to serious derangements of the health. In childhood they have a more serious meaning than in adult life. They often indicate the approach of scarlet fever, or measles, or of other diseases.

Headaches are more common among the civilized than the uncivilized; more frequent among females than among males; among those of sensitive feeling than among the more obtuse; among those who think much than among those who think little; among the sedentary than among the active.



**Causes of Headaches.** — They are dependent on various causes, as derangement of the circulating system, of the digestive organs, of the nervous system, etc. Among those dependent on disturbance of the circulation, are

**Headaches from Eye Diseases.** — Myopia, or near-sightedness; Hypermetropia, or far-sightedness; Astigmatism, or the inability to see equally well horizontal and vertical lines, as well as other irregularities of vision, are frequent sources of headache. These headaches are caused by overtaxing certain groups of muscles, or by fixing the eyes too long on one objective point, as experienced in prolonged study or reading, especially under unfavorable circumstances. These headaches are more or less similar in their symptomatology. The ache is generally dull, situated mostly in forehead and over eyes, but may also be spread from base of brain to the eyes; oftentimes it is accompanied by nausea, especially after prolonged use of eyes under improper conditions.

The treatment of these headaches consists in absolute rest of the eye, in case of overwork, and the fitting, by a competent oculist, of such glasses as will rectify the irregularity in the eye proper.

Astigmatism is a common source of headaches, and often is so insidious in its development as to escape attention. A rough test may be made by drawing several horizontal and several vertical lines in close proximity, and then placing at some distance (15 to 20 feet) from the eye. If either set cannot be as clearly seen without blurring as the other, you have good cause to suspect Astigmatism, and should consult an oculist. Do not dally with these eye-headaches, as you will be doing a permanent injury to your eyes.

**Tea and Coffee Headaches.** — In the nervous, and oftentimes in the gouty and rheumatic person, the use of tea or coffee will cause violent headaches. Tobacco likewise after prolonged use shows a tendency to headaches. These luxuries of life should be discontinued at once for at least one month. An extra strong cup of black coffee, to be sure, will stop the headache for the time being, but only adds fuel to the fire in the long run. Bromo-caffeine, as ordinarily sold by the druggists, taken in teaspoonful doses every half hour, will relieve the malady. We would strongly advise any one that has constant or periodical headaches, if he uses either tea or coffee, and especially coffee, to leave them off entirely for three months. It may be the sole cause, and if caused by tea or coffee, there is no possibility of their cure by medicines while you continue their use.

**Plethoric Headaches.** — These are dependent on a general fulness of blood. They are of two kinds. One is occasional, and lasts but a few hours. The other lasts for days or weeks. It occurs most often in the night or morning. Persons whose occupations require stooping have it most. A little dizziness is generally felt on rising up from a stooping posture. It is brought on by the bad air of

crowded rooms, and is attended by costive bowels, short breath, and a white furred tongue.

The persistent headache is accompanied by a sense of fulness, and sometimes of throbbing over the brows and temples, with a sensation of dizziness, and of mist before the eyes. The sufferer fears exertion and is constantly looking for a rush of blood to the head. Nature sometimes relieves this form of headache by a diarrhoea, or by bleeding from the nose.

There is another form of plethoric headache, differing slightly from the above, in which there is too much blood, and it is made too fast, but it does not circulate so rapidly. The muscles are not very firm, and the heart does not propel the blood with much force. This form of headache is connected with *congestion*.

**Headaches of Indigestion.** — These are caused either by taking improper articles of food, or by eating too much of those which are proper. The sensation in the head is not always a pain, but sometimes only a dull weight, attended by languor and disinclination for exertion; a tongue white in the centre, and pale red at the tip and edges; cold and numb fingers; slight nausea; languid and feeble pulse; dim and indistinct sight; eyes aching when employed; and difficulty in fixing the attention.

**Sick Headache.** — This has received its name from the constant nausea or sickness at the stomach which attends the pain in the head.

This headache is apt to begin in the morning, on waking from a deep sleep, or after sleeping in a close room, and when some irregularity of diet has been committed on the day before, or for several previous days. At first there is a distressingly oppressive feeling in the head, which gradually merges into a severe, heavy pain in the temples, frequently attended by a sense of fulness and tenderness in one eye, and extending across the forehead. There is a clammy, unpleasant taste in the mouth, an offensive breath, and the tongue covered with a yellowish-white fur. The sufferer desires to be alone, and in the dark. The hands and feet are cold and moist, and the pulse feeble.

Accompanying these symptoms, there is a depressing sickness at the stomach, which is increased by sitting up, or moving about. After a time, vomiting comes, and relief is obtained.

**Bilious Headache.** — This is most common in summer and autumn. It afflicts persons of dark complexion with black hair and melancholy dispositions. There are two kinds, one is due to an accumulation of bile in the system; the other, to a large secretion of bile.

In the first variety the skin is dingy and sallow, the spirits depressed, the bowels costive, and there is wind in the stomach, with a dull, aching pain on the right shoulder. The pain is in the forehead,



eyebrows and eyelids, and the "white of the eye" is a little yellowish. The tongue has a brown fur, and is cracked in the centre. There is a bitter taste in the mouth on waking in the morning, after restless nights, and frightful dreams.

In the second variety, which is due to an "overflow of bile," the symptoms are much like those of the first kind, but the pain is not so continuous. In addition to the symptoms named, there is a throbbing, rending pain in the head, the skin is hot and the face flushed, the limbs are sore, and there is a luminous halo or ring around objects looked at, and a feeling of giddiness.

**Nervous Headaches.** — These are more common among females than males. They occur most frequently among persons of high susceptibility, who are easily elevated, and as easily depressed. They are often connected with indigestion.

The pain is usually acute and darting, and is made worse by light, with a feeling as if the temples were being "pressed together," and a "swimminess" in the head. There is sometimes a sense of sinking, with a dread of falling, and great despondency and restlessness. The bowels are generally costive, and the sight dim. The pain comes on most commonly in the morning, lasts through the day, and abates in the evening.

**Hysteric Headache.** — There is a nervous headache dependent on the *hysterical* condition. It is generally confined to one small spot, frequently over the eyebrow, and is sometimes compared to a wedge or nail driven into the skull.

**Headache from Exhaustion.** — Still another species of nervous headache arises from extreme exhaustion, produced by great loss of blood, by diarrhoea, or by over-suckling. The pain is generally on the top of the skull, and is often compared to the beating of a small hammer on the head.

**Brow Ague.** — This is intermittent in its character, and is brought on by exposure to cold and moisture in damp and marshy districts; and in this respect is much like ague.

**Megrims.** — This is most frequent among females. It is often dependent on the same causes as Brow Ague, and is also produced by long and exhausting watching over sick children, distress of mind, and indigestion.

In both the above forms, the pain is intermittent, seldom lasting long, but being of a sharp, piercing character like that of tic douloureux. The pain of Megrims usually begins at the inner angle of the eye, and extends towards the nose; the parts being red and sore, and the eye-ball tender. In Brow Ague, pain and great tenderness cover an entire half of the head, compared by the patient, sometimes, to "an opening and shutting of the skull." It begins with a creeping sensation over the scalp.

**Rheumatic Headaches.**— These generally affect persons who have been subject to rheumatism, and are often brought on by uncovering the head when sweating. The pain is usually in the brow, the temples, or the back of the head, and is dull and aching, — rather an intense soreness than a real pain; and the painful part is excessively tender upon pressure. The skin is moist, but not hotter than natural.

**Treatment.**— In considering the treatment, I will take up the same order in which I have spoken of the different forms of headache.

**Plethoric Headaches.**— Not much medicine should be taken for these, if it can be avoided. A diuretic (131) may be taken twice a day, and an occasional dose of gentle physic at night, followed by (7) in the morning. This will generally give great relief.

Meat should be taken but once a day, and the whole diet should be spare, the appetite never being fully satisfied. All spirituous drinks, including distilled and fermented, should be let alone, and coffee likewise.

Much exercise should be taken in the open air. The hair should be kept short, and the head elevated during sleep. Bleeding at the nose, when it occurs, must not be too suddenly stopped. Two drops of the tincture of aconite root with three of the fluid extract of gelsemium repeated once a half hour for three or four times will be found to be of great value in the treatment of this form of headache.

The hot-water bottle applied to that part of the spine between the head and shoulder blades will also give great relief.

**Congestive Headaches.**— The exercise, diet, mode of sleeping, etc., should be the same as in plethoric headaches. In this complaint, there is too much blood in the head, and it inclines to stagnate. The feet and hands are cold; and gloves and stockings of wool, and other bad conductors of heat from the body, must be worn.

Occasionally a little gentle physic (319) is desirable to induce the bowels to act every day. If there is great debility, iron (71), (74), (75), (320), will be required. The ice bag applied to the last six or eight inches of the spine will call the blood to the extremities. The aconite and gelsemium recipe as given above is also very useful.

**Headache of Indigestion.**— If the pain come immediately after a meal, and can be traced to something eaten, an emetic (2) may be taken, if the person be tolerably strong. If the pain come on some hours after eating, take rhubarb and magnesia (28), (14), or fluid magnesia. When the system is debilitated, take a warm draught (322) in the morning after a light breakfast, or twice a day, a bitter with an alkali (323). If the stomach be very irritable, bismuth, at meal times (324), (326). When it occurs after a debauch, take recipe (325).

**Sick Headache.**— When it results from food taken, a draught of warm chamomile tea, or a little weak brandy-and-water, will generally



give relief. If the sickness continue, soda and water, with a little ginger may do well, or a mustard poultice upon the stomach (165) may be required. As soon as it can be kept on the stomach, a dose of physic (326) must be taken; and if relief does not come after the operation of this, give a bitter and an aromatic (327). The patient must have perfect rest. If there be great lack of tone in the system, the mineral acids (328), (329) will be excellent.

The diet must be carefully regulated, as in plethoric and congestive headaches. Cocaine, one-eighth grain every fifteen minutes till the nausea stops, and then a dose of physic is an excellent method of treatment. Ten grains of amonol (ammonol) every hour will stop the pain, and very often the same amount of phenacetine will accomplish the same result.

**Bilious Headaches.**—These are generally connected, more or less, with some affection of the liver.

During an attack, if the suffering be great, attended by nausea, give an emetic (2). In milder cases, give recipe (321). If there be costiveness, give recipe (330) at night, and (7) in the morning.

A few doses of podophyllin, leptandrin, etc. (34), (36), (39), to relieve the liver when the bile does not flow fast enough, will diminish the frequency and force of the attack. The fluid extract of dandelion, taken for some time, often does good service.

The diet should be light, and chiefly vegetable, and exercise in the open air must not be omitted. The daily sponge-bath, with friction, is excellent,

**Nervous Headaches.**—The first thing to be done is to relieve the pain, and this may generally be accomplished either by preparation (331), or (332), or (333), or (88), or (93), or two or three drops of tincture of nux vomica in a spoonful of water, taken three times a day. 351 will be found usually to be of most service.

In simple nervous headache, *diet* is of the greatest importance; in hysterical cases, *exercise*; in headaches from exhaustion, tonics (81), (79), (63), (73), (64), (61), (60).

Of the simple remedies found on the druggists' counter bromide of caffein in effervescent form is very efficacious.

**Rheumatic Headaches.**—Take a light diet, with but little animal food. Wear warm clothing, and avoid exposure to wet feet and dampness generally, and go to a mild climate, if convenient.

When the local pain is great, apply hot fomentations, or a stimulating liniment (334), or a mustard poultice, to the back of the neck. In the beginning of the treatment, a little physic at night (335) is useful. 10 grs. potassium iodide, gradually increased, in water, is the best medicine.

Before closing this chapter on headaches, let me enter a respectful protest against the indiscriminate use of the thousand and one remedies advertised to cure headaches; for in a great majority of cases it

is merely a symptom of some other disease; for instance, Indigestion, Fever, Bright's Disease, Softening of the Brain, Diseased Liver, etc.; and the use of these remedies serves rather to increase than lessen the difficulty. Much has been written and much printed matter been given away by patent medicine venders vaunting their specific cures for headaches. These venders have grown in numbers of late, since the introduction into medicine of the coal-tar products, so that samples of headache cures may be found on one's doorsteps every little while. For the most part they are composed of what is known as acetanilide or antifebrin, because of its cheapness as compared with other coal-tar products. It is, however, the most harmful of them all, often causing blueness of the lips, fluttering of the heart, dizziness, faintness, etc. Of other similar products not so much danger may be expected, and yet no one ought to resort to these remedies without the consent and approval of the family physician. Eight grains of phenacetine for an adult, repeated in two to four hours, no doubt will cure more headaches of all descriptions than any other single drug. Lactophenin and ammonol are some of the newer remedies for headache which have the reputation of being efficient as coal-tar products without any of their ill effects. Antikamnia, a proprietary medicine of the coal-tar group, enjoys a large sale, not only for headaches, but for general neuralgic pain, and, if employed in six-grain doses every two to four hours, according to the severity of the pain, will stop a large proportion of these aches. The various combinations of the bromides are always safe, and often quite efficient in curing headaches, especially if nerve-element is strong in their causation; bromo-caffein, bromo-seltzer, bromo-soda, etc., are generally put up in small bottles in an effervescent and palatable form.

### Locomotor Ataxia

Locomotor ataxia, also known as tabes, is an affection of the spinal cord, and although much more is known about the disease to-day than ever before, yet since 1847 it has had its present name.

The particular portion of the cord which controls the muscle sense is diseased, and it is not until very late in the trouble that losses of power are apparent. Men are more often afflicted than women, and most of the cases occur between the ages of thirty and forty-five.

The venereal disease of syphilis is responsible for about three fourths of all the cases, and mental worry or shock, blows on the spine, falls, overwork, exposure to cold or storms, excessive use of stimulants and tobacco, and sexual abuses, are the cause of the remainder.

**Symptoms.** — What are known as the three cardinal or chief symptoms of locomotor ataxia are *loss* of the patella tendon reflex, the reaction of the pupil of the eye, known as the Argyll Robertson pupil, and the swaying symptom known as the Romberg sign.

The first is the *absence* of the usual sharp jerk to the leg, which occurs in healthy persons when the tense tendon or cord just below



the knee-pan is sharply tapped, if the leg is at a right angle to the thigh. The second is absence of reaction of the pupil to *light*. In a healthy person the pupil dilates and contracts to both accommodation (or distance) and to light, while in this disease it only responds to the first.

The swaying symptom is noticed if a patient affected tries to stand with heels together and his eyes closed. While he will be unaffected if they are open, as soon as he closes them he sways violently and many times will fall. Other symptoms are pains in the calves of the legs and stomach, which shoot with lightning rapidity through these organs. There occur tingling and burning sensations about the head, neck, and extremities, shuffling gait, due to the loss of that sense which tells what position the feet are placed in, and requiring the eyes to be on the ground to prevent the patient from falling down. Disturbances of vision occur, and later a general weakness of the body from lack of sufficient exercise.

While a cure cannot be promised or expected, yet the disease may be arrested and controlled to a greater or less degree and its extension limited to slow progress.

**Treatment.** — Iodide of potash should always be tried in every case and under a physician's direction, as the time lost in experimenting can never be regained. Beginning with ten grains three times a day, rapidly increase to the point where the system is saturated, and then continue at this point for some time. Mercury, either by the mouth or rubbed into the skin, is a useful addition.

For the relief of pain, phenacetine or some other anodyne preparation will have to be given, though morphine should be avoided, unless absolutely necessary, owing to the liability, as in any chronic disease, of acquiring a habit.

Bromide of potash in doses of ten to thirty grains may be given to quiet the nerves.

Proper exercises, not carried to the point of fatigue, massage of the muscles, hot baths and electricity, all have their place and prove useful.

## NEURASTHENIA. (*Nervous Prostration.*)

Neurasthenia is a condition of the nervous system which by reason of excessive fatigue has become so exhausted that the working powers of the body do not act in their natural manner.

What might cause a condition of Neurasthenia in a nervous person would not effect a slow-going, phlegmatic person. On the other hand a condition severe enough to cause excitability and ungovernable irritability of temper in the latter might be sufficient to cause insanity in the former case.

It is in the high-strung, nervous society woman or the overburdened business man that this trouble is prevalent.

**Symptoms.** A person afflicted with Neurasthenia may manifest it in its simpler forms by excessive nervousness, irritability and general crankiness. In aggravated form by melancholia, conditions with gloomy forebodings, a desire to be apart from friends, the afflicted has headaches, is unable to sleep, has dizzy attacks or vertigo, loss of memory. Cannot concentrate attention for any length of time, and later on muscular and other weaknesses are noticeable.

**Treatment.** Complete rest, suitable food, proper stimulation and surroundings of improved hygienic and moral conditions. Massage, baths of different varieties, travel, light reading, release from trying cares, fresh air and change of occupation are necessary to effect a cure.



DISEASES of the THROAT

# DISEASES OF THE THROAT.

(Also see *Anatomy of Throat and Anatomy of Vocal Organs.*)

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THE diseases which seat themselves in the throat, and in the great cavity of the chest, have occupied a large share of my attention for the last ten years. My practice in these complaints has been large, —being drawn from every part of the United States, and the British Provinces. No class of diseases from which men suffer are more numerous than these, and none have so generally baffled the skill of the profession. For this reason, I wish to present here a brief, practical, and common-sense view of these complaints, which shall be of real value to the thousands of families who consult these pages.

**Increase of Throat Diseases.**—A striking increase in the number of throat diseases has been witnessed within the last few years. A person suffering from any of them will find, on speaking of his complaint, that a number of his neighbors are afflicted with troubles of a similar kind. I have thought that in some of their forms these diseases have fastened upon the throats of not less than half our population. And when it is considered that they are the natural, and if unmolested, the certain harbingers of lung disease, it is wise to make a note of the above fact. As I shall describe them in the nasal cavities, the pharynx, the fauces, etc., they all have a natural proclivity downwards. From these upper cavities they pass, by one short step, into the larynx,—the cavity where the voice is formed,—and then, by another equally short and easy stage, into the body of the wind-pipe. It is a singular fact that their progress is always from the upper breathing passages downward, and never from the lower passages upward. They afford a parallel to the order of progression in the moral world, in which evil tendencies are toward a lower depth.

**A Mistake Corrected.**—Before describing the several diseases which belong to this family, I wish to correct the mistake which so generally classes them all under the term *Bronchitis*.

They all consist in a simple inflammation, acute or chronic, either of the mucous membrane lining the several cavities to be spoken of, or of the small glands or follicles connected with that membrane; and each disease takes its name from its particular location. Thus, the inflammation of the membrane lining the upper part of the throat, or pharynx, is called *Pharyngitis*. Inflammation in the top of the



windpipe, or larynx, is *Laryngitis*. In the windpipe, or trachea, it is *Trachitis*. In the bronchial tubes, it is *Bronchitis*. As the bronchial tubes exist nowhere except in the lungs, below the division of the windpipe, there can be no Bronchitis in the throat. Nevertheless, it is the same disease with Laryngitis and Pharyngitis, and differs from them only in being in a more dangerous place.

As the windpipe descends into the chest, it divides below the top of the breast-bone into two branches, one going into the right, the other into the left lung. These branches divide and subdivide very minutely, and send their ramifications into every part of the pulmonary tissue. Thus situated, Meckel has compared the windpipe to a

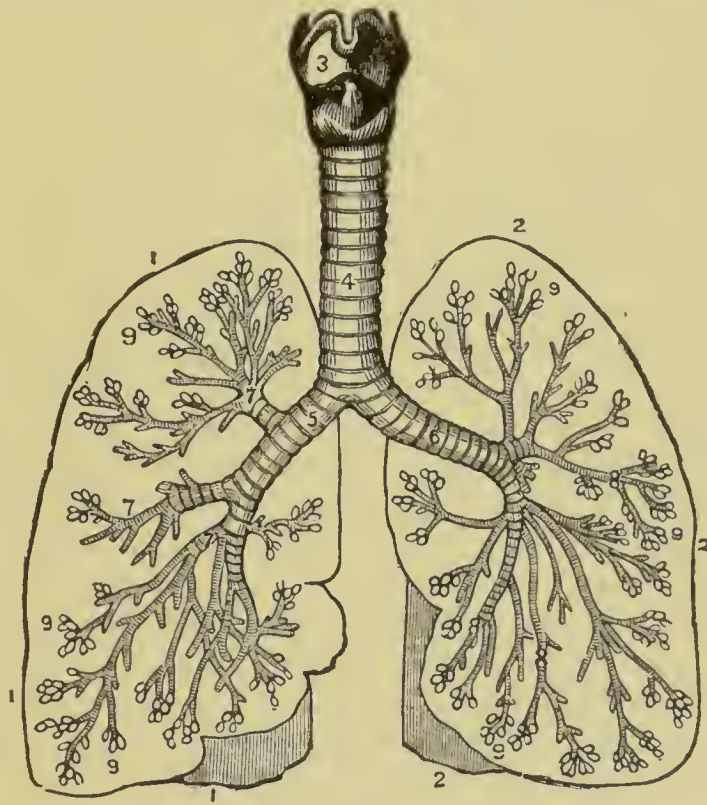


FIG. 86.

hollow tree with the top turned downward,—the larynx and trachea representing the trunk, and the bronchial tubes, with their innumerable subdivisions, the branches and twigs. (Fig. 86.)

If the reader will now understand that the trunk and branches of this bronchial tree are hollow throughout, and lined with a delicate and smooth mucous membrane, and that the diseases to be described are inflammation either upon this membrane or the small glands connected with it, causing swelling, redness, unhealthy discharges, roughness, etc., he will have a good general idea of them.

### Nasal Catarrh.

I TAKE these diseases in the order of their location. Nasal Catarrh consists in inflammation, which begins behind and a little above the

veil of the palate, and extends upward from thence into the nose. It is an exceedingly troublesome complaint, and afflicts great numbers. It passes under the name of Catarrh in the Head.

The inflammation is not confined to the nasal cavities. It extends frequently to the air-cavities, called *antrums* and *sinuses*, which cover a considerable portion of the face, and extend to the lower part of the forehead. Persons sometimes feel as if their whole face were involved in the disease, and were almost in a state of rottenness, — so great is the amount of matter discharged from the head. Such free discharges cannot be wondered at when we reflect that all the air cavities in the face are lined with the same mucous membrane which lines the nose, and that they all communicate with the nasal cavities.

The “horn ail,” among cattle, is a similar inflammation of the inner surface of the horns; and the “horse distemper” is an inflammation of the air cavities in the head of the horse, and is much the same disease with our catarrh in the head.

The catarrh often creates a *perpetual desire to swallow*, and gives the feeling, as patients express it, “*as if something were sticking in the upper part of the throat.*”

When the inflammation has existed a long time, and ulceration has taken place, puriform matter is secreted, and drops down into the throat, much to the discomfort of the patient. Indeed, this is one of the most distressing features of the complaint, as this matter often descends into the stomach in large quantities, causing frequent vomiting, and a general derangement of the health. Many times the sufferer can only breathe with the mouth open. Upon rising in the morning a great effort is required to clear the head and the extreme upper part of the throat. There is occasionally a feeling of pressure and tightness across the upper part of the nose; and the base of the brain sometimes suffers in such a way as to induce headache, vertigo, and confusion. The smell is frequently destroyed, and sometimes the taste. The inflammation sometimes gets into the Eustachian tubes, the mouths of which are behind and a little above the veil of the palate, and extends up the lining membrane to the drum of the ear, causing pain or deafness, and occasionally both. In addition to this catalogue of evils, there is often added inflammation and elongation of the uvula or soft palate.

**Treatment.** — The following is a fair illustration of my mode of treatment: —

Mr. —, of Boston, came under treatment for a bad case of catarrh in the head, complicated with follicular disease of the pharynx, or upper part of the throat. In addition to nearly all the symptoms mentioned above, he had a stench from the nose exceedingly offensive to all about him. So much had the disease worn upon him that he had become bilious, sallow, dejected, and low in strength and flesh.

When it is said that to all these were added a cough and loss of appetite, with insidious approaches of hectic, it will not be surprising



that his friends saw the most serious results impending, even though assured by me that the disease had not yet taken a firm hold of his lungs. The first thing done for him was to cut off the uvula. Five days after, I began to bathe the whole nasal cavity, three times a week, with a shower syringe, by pushing the smooth bulb up behind the veil of the palate, and throwing instantaneously a most delicate shower of medicated fluid up both sides of the septum. The upper part of the throat was likewise bathed by the use of a shower syringe made expressly for that part, and the larynx, or place where the voice is formed, by a long, bent instrument made to reach this part of the throat. The solution used consisted of half a dram of crystals of nitrate of silver dissolved in one ounce of soft water.

The nitrate of silver powder was inhaled once a day with the powder inhaler. In this way the nasal cavities and throat were kept cleansed, and the articles used gradually subdued the inflammation, setting up a new and healthful action in place of the diseased one. The stomach was relieved of the offensive matter which had daily and nightly gone down into it, and the system of the poisonous effects of its absorption. The great danger which threatened the lungs, and which would soon have been realized in their destruction, passed away. The skin gradually resumed its proper color; the appetite, flesh, spirits, and strength came back, and Mr. B. has been since in the enjoyment of good health, pursuing his business cheerfully.

When the above treatment fails, as it does occasionally, I am in the habit of changing the solution, using sometimes a weak solution of acid nitrate of mercury, twenty drops to an ounce of water. In other cases, a solution of sulphate of zinc serves a good purpose. A dilution of the tincture of arnica-flowers is a preparation of some value in these cases. There are other preparations, too numerous to mention, which I am in the habit of using. I will add, that the nitrate of silver powder, snuffed once a day, a pinch at a time, is far more successful than any other *snuff* ever made, but should be used only in severe cases, and with caution.

Nasal catarrh is such a common affliction in the Eastern States, as to be a widespread curse. Douching the nose with salt and water (warmed) cleanses the nose of the foul mucus. The douche should be from a bag hanging only a little higher than the head, or it may be given by means of a common, blunt-pointed syringe, care being taken not to use too strong force, nor to point the syringe in the direction of the eyes. The stream of water should be directed straight ahead parallel with the floor; the mouth must be open, and the patient assume the position of the countryman when gazing or gauking at the sights on his first visit to the city. The water then runs down the throat and also out of the other nostril. This process should be employed on both sides till the head is clean. The tablets put up by all wholesale druggists, called "Carl Seiler's alkaline tablets," is the best remedy for a nasal douche.\* The subsequent treatment is best ad-

\* One of these tablets dissolved in a half cup of water. Practically the same solution may be made by adding to the same amount of hot water 10 grains of borax, 15 grains of cooking soda and 5 grains benzoate of soda.

vised by a physician, and usually consists in the use of some inhalation or spray.

### **Inflammation of the Pharynx.**—*Pharyngitis.*

THIS is an inflammation of the upper and back part of the throat, or all that part which can be *seen* when the mouth is stretched open. It causes a redness of the mucous membrane lining the part, which is deep in proportion to the intensity of the inflammation. This complaint is generally connected with the one I am about to describe; and since the treatment is the same the reader is referred to what next follows.

### **Adenoid Growths.**

IN young children a very disagreeable catarrhal affection often exists in the naso-pharynx just behind and above the uvula. This is caused by continued catarrh till at last small growths occur like proud-flesh, and not infrequently block up the passage from the nose to the mouth, to that extent that not only is loud snoring produced at night, but breathing becomes difficult by day. In severe cases the upper jaw becomes angular, and the face assumes a peaked, pinched look. These growths are extremely common in children, and are productive of much mischief. The inability, in severe cases, to properly breathe deprives the lungs of their proper amount of oxygen, so that the little one suffers in nutrition and growth.

**Treatment** consists in scraping away with a scoop, or even with the finger, these soft, granulating masses. The effect is almost marvellous: the child breathes quietly, without snoring, the color returns to the cheeks, and the blood receives a new supply of food from the full supply of oxygen. In modern times, nothing has been inaugurated in the treatment of children's throat and nose diseases so beneficial and happy.

### **Clergymen's Sore Throat.**—*Follicular Pharyngitis.*

THIS disorder made its appearance in this country in 1830, and the attention of the profession was first drawn to it, *as a distinct disease*, in 1832. Some have supposed its origin to have had a hidden connection with the epidemic influenza which spread over the civilized world in 1830, and affected all classes of persons; but this is only conjecture. In its early developments it attracted notice chiefly by its visitations upon the throats of the clergy. Hence its popular name of *Clergymen's Sore Throat*. It was soon found, however, to attack all classes of persons indiscriminately, whether engaged in any calling which required a public exercise of the voice or otherwise. It was noticed more by public speakers and singers, on account of the greater inconvenience it gave them.

The disease consists in a chronic inflammation of the mucous fol-



licles, or glands, connected with the mucous membrane which lines the throat and windpipe. The office of these little glands is to secrete a fluid to lubricate the air passages. When inflamed, they spread an acrid, irritating fluid over surrounding parts, which excites inflammation in them. Hence a general inflammation of the upper part of the throat or pharyngitis usually attends the follicular disease, and I shall speak of the two together. This inflammation of the glands and the membrane, being neglected, as it generally is, lingers on from month to month, or from year to year, making in some cases slow progress, in others more rapid,—made a little worse and its step slightly quickened by every fresh cold, and finally results in ulceration. The expectoration thenceforward becomes puriform, and finally undistinguishable from that of consumption, with all the symptoms of which the patient finally dies. Indeed, before its nature was understood by the profession, it was considered the most fatal form of consumption, because it could be affected only in a very small degree, if at all, by medicines taken into the general system. For the milder cases one will find great comfort in the use of the troches of cubebs and ammonia, the inhalation of benzoin with steaming water, also from such throat-tablets as the Chloramine.

### Inflammation of Mucous Membrane and Glands of Larynx. — *Follicular Laryngitis.*

A FEW strong and beautifully formed cartilages unite to form a curious and convenient box or cavity at the top of the windpipe, called the larynx. Across this enclosure are stretched two remarkable ligaments, called the vocal cords. They are from half to three quarters of an inch in length, and are rendered more or less tense by the small muscles with which they are connected. Just above these cords are two cavities, which, with the ligaments, act an important part in the formation of the voice. Here is produced the *sound*, which is modified and *articulated* by the tongue, the lips, and the nasal cavities.

When disease reaches this cavity, and the fluid secreted to lubricate these cords becomes acrid, the voice, from this and other causes, is made hoarse; and when, at length, these ligaments are altered in structure by inflammation and ulceration, the voice suffers a gradual extinction. I have treated a large number suffering entire loss of voice, and am happy to say it has been generally restored, where the lungs have not been involved in the disease. There is often also a little sensitiveness, or even soreness, in some cases, in the region of the larynx, which may be felt by pressing upon that prominence in front of the throat, called Adam's apple.

### Inflammation in the Windpipe.—*Tracheitis*.

THIS complaint and the one preceding it differ only in their locality from those described in the upper cavities; and they are more alarming, because two removes nearer the citadel of life. Happily, we know that the seat of these diseases may be easily reached, and we have a shower syringe, so arranged as to pour the remedial agent directly upon them, without any lacerating disturbance of the parts.

**Symptoms.**—The approach of these disorders is often so insidious as hardly to attract notice,—sometimes for months or even years,—giving no other evidence of their presence than the annoyance of something in the throat to be swallowed or hawked up, an increased secretion of mucus, and a sense of wearisomeness and loss of power in the throat after public speaking, singing, or reading aloud. At length, upon the taking of a severe cold, the prevalence of an epidemic influenza, or of an unexplained tendency of disease to the air-passages and lungs, the throat of the patient suddenly becomes sore, its secretions are increased and rendered more viscid, the voice grows hoarse, the difficulty of speaking is aggravated, and what was only an annoyance becomes an affliction and a source of alarm and danger. These diseases clearly belong to the family of consumption, and need early attention.

**Causes.**—It is amusing to reflect upon the theories which writers were in the habit of constructing, a few years since, to account for the throat affection among the clergy. It was attributed by some to speaking too often, by others to speaking too loud. One class of writers thought it arose from muffling the neck; another, from a strain of voice on the Sabbath to which it was not accustomed on other days.

The cause lies deeper than any of these trifling things. As it concerns ministers, it may generally be expressed in two words,—labor, anxiety.

The clerical order are placed just where they feel the force of the high-pressure movements of the age. They are the only class of recognized *instructors* of adult men, and are obliged to make great exertions to meet the wants of their position. The extremely trying circumstances in which they are often placed, too, in these exciting times, by questions which arise and threaten to rupture and destroy their parishes, weigh heavily upon their spirits, and greatly depress the vital powers. And, when we add to this the fickle state of the public mind, and often the shifting, fugitive character of a clergy man's dwelling-place and the consequent liability to poverty and want to which himself and family are exposed, we have a list of depressing causes powerfully predisposing to any form of disease which may prevail.



It will be pardoned me, I think, if I suggest here, that the nature of a clergyman's calling is of so serious a character, that he sometimes carries himself with too much sedateness, keeps himself too much braced up, and does not allow himself hours enough of that cheerful, light-hearted abandon, which is essential to the health of every sedentary man of mental habits. The hard-thinking and hard-working minister, who will retain his health and save his throat, must have *some* moments, at least, when the weighty responsibilities of his office are lifted up from his soul, and he becomes, for the hour, the jocund, playful boy of earlier days. How *far* he can consistently relax and let himself down, or in my view of the matter, *raise himself up* to the simplicity and mirth of childhood, he alone can be the judge. As a physician, I prescribe; as a minister, he must decide how far my prescription can be followed.

**Reading Sermons.**—There is one practice, which, though it has not much to do with *inducing* this disease, does frequently aggravate it when once established; I mean the habit of reading sermons from manuscripts, — especially when it is done in a sort of mechanical way. Every person who has suffered from throat-ail has doubtless noticed that to read aloud, for half an hour, from a book, occasions more fatigue and irritation in the throat than extemporaneous speaking, in the same tones, for one or two hours. The reason is, that in the latter case the mind conceives the thought in season for the organs of speech to fall into a natural attitude, and utter it with ease. The two work harmoniously together, — the instruments of articulation following the mind, and easily and naturally uttering its conceptions. Whereas in the case of reading, the mind itself is, at least partially, ignorant of what is coming until it is just upon it, so that the organs of speech, being warned of what is to be done only at the moment their service is required, do their work under a perpetual surprise and constraint. The difference is, in some respects, like that between walking freely at large, without regard to where the feet are put down, and being obliged to step exactly in the footprints of some traveller who has gone before. In the latter case, the muscles tire much sooner, because they work in fetters.

I have thus spoken particularly of the clergy, though it is not by any means they only, but all classes of people who are afflicted with this dangerous malady.

These diseases often *begin* with a cold. But colds are seldom taken except when the nervous system is depressed, so that they are, in fact, to be traced back to the same cause which I have assigned to catarrhal or throat complaints themselves.

**These Complaints Worse at Night.**—It is worthy of note, that all these complaints, and many others, are worse during the night. This is easily explained when we remember that the atmosphere has the least amount of electricity in it at three o'clock in the morning, and that the first minimum atmospheric pressure, which happens twice a

day, occurs not far from the same hour. *From three to four in the morning, therefore, the nerve-power sinks to its lowest ebb*; and those diseases which owe their existence to anxiety, overwork, etc., suffer, at this time, their greatest daily aggravation. Death occurs, too, more often during these hours, than in any other portion of the twenty-four.

**Treatment.**—Some years ago these diseases were thought to be incurable; and by all the appliances of medical art then known, they were so. But time has brought a successful method of treatment, as well as a clearer knowledge of their nature.

This treatment consists in what is called topical medication, or the applying of the medicine directly to the diseased part. The medicinal agent more extensively used than any other is a solution of *crystals of nitrate of silver*. This substance is not, however, adapted to *every* case,—other articles succeeding better in some instances. Modern chemistry has given us a variety of agents from which the skilful physician may select a substitute, should the nitrate of silver fail.

The operation of applying this and other substances to the air passages, is a delicate one, requiring tact and experience. Surgeons had supposed it an anatomical impossibility to introduce an instrument into the larynx; but this has been practically demonstrated to be a great mistake.

**Instruments.**—The instrument devised and used by Dr. Horace Green is a piece of whalebone, bent at one end, to which is attached a small, round piece of sponge. This, dipped in the solution, is dexterously introduced into the laryngeal cavity, and applied directly to the diseased part.

I formerly used this instrument myself, and am happy to know, that, notwithstanding its defects, it was generally successful. Yet where the larynx was highly inflamed, with a swollen and ulcerated condition of the epiglottis and lips of the glottis, I am sure I sometimes had the singular powers of the nitrate of silver put at defiance by an irritation evidently produced by the sponge of the probang. Upon its introduction, in such cases, the parts contract upon and cling to it, and suffer aggravated irritation, almost laceration, upon its withdrawal, however carefully effected.

**Laryngeal Shower Syringe.**—Such defects in the probang led me to contrive an instrument, which I call a *Laryngeal Shower Syringe*. It is in the form of a syringe, the barrel and piston of which are made of glass, silver, or gold, as may be desired. To this is attached a small tube, made of silver or gold, long enough to reach and enter the throat, and bent like a probang, with a *globe* or bulb at the end, from a quarter to a third of an inch in diameter, pierced with very minute holes, which cover a zone around the centre about one-third of an inch in breadth.

This silver bulb I daily introduce into highly inflamed and ulcer-



ated larynges, generally without any knowledge of its presence on the part of the patient, until the contained solution is discharged. The instrument, being charged, is carried to the proper place, when a delicately quick pressure upon the piston causes very fine streams to flow through the holes in the form of a delicate shower, and all sides of the walls of the larynx are instantaneously bathed.

**How Introduced.**—The introduction of this instrument into the larynx is easy. Upon the approach of any foreign substance, the epiglottis instinctively drops down upon the entrance to the larynx, guarding it against improper intrusions. It has been found, however, that when the root of the tongue is firmly depressed, this cartilage *cannot* obey its instinct, but stands erect, its upper edge generally rising into view. Availing himself of this, the surgeon has only to depress the tongue with a spatula, bent at right angles, so that the left hand holding it may drop below the chin out of the way, and as the epiglottis rises to view, slip the ball of the instrument over its upper edge, and then with a quick yet gentle motion, carry it *downward* and *forward*, and the entrance is made. I have often admired the faithfulness of this epiglottic sentinel, who, when overborne by superior force, stands bolt upright, and compels us to enter the sacred temple of speech *directly over his head!*

**Pharyngeal Shower Syringe.**—For washing the upper part of the throat, I construct the instrument with a *straight* tube, with holes over the outer end of the globe, and extending to the centre. This washes instantaneously the fauces and pharynx, but does not throw the solution back upon the tongue. Its main advantage over the probang is, that it bathes every part of the fauces and pharynx instantaneously, and does not subject the patient to the coughing and gagging which follow the slower and rougher process of drawing the sponge from side to side across the cavity of the throat.

**Nasal Shower Syringe.**—Inflammations in the back passages to the nose, called catarrh in the head, have been almost inaccessible by any reliable healing agent, and consequently incurable. The probang could only reach a *short distance*, and occasioned great suffering. I have had a syringe constructed with the tube bent at an angle of forty-five degrees, and the globe, very small, pierced with a few fine holes at the upper end. Carrying this globe up behind the velum palati, with a single injection I wash both passages clear through. I have had the pleasure of curing a large number of bad cases, of many years' standing, to the surprise and delight of the patients.

About nineteen-twentieths of the physicians who have examined these instruments, and so far as my knowledge extends, all who have used them, think them much better than the probang. As to patients, I have yet to see one who will allow the sponge to be used after trying both.

**Have Superseded the Probang.**—In my own practice the syringes

have superseded the probang *altogether*. My reasons may be briefly stated. I have already said there is less irritation produced. A piece of sponge drawn over an inflamed surface, especially when clung to by the irritated and quivering parts, must necessarily, in some cases at least, aggravate the symptoms of disease. To this consideration add the comfort of the patient during the operation. It is so quickly and delicately done with the syringe, that it is scarcely known when the act is performed. The straight syringe does not touch the throat at all. On touching the probang to the throat, the nitrate of silver unites with the mucus upon the surface, instantly covering the sponge with an albuminous pellicle, something like that which lines the shell of an egg, preventing, in a degree, the further pressing out of the solution, and rendering its contacts with other parts of the surface comparatively powerless. For this reason, the sponge pushed down into an ulcerated bronchus, as Dr. Green recommended, must be utterly valueless as a remedial agent. Mopping, as it does in its whole course, a larynx and trachea, lined in some cases with puriform matter, and generally with mucus, every inch of its descent doubles the gravity of this objection. Let it be considered, too, that in applying the remedy to an ulcerated larynx, the sponge cauterizes the healthy parts above, in its descent, and thus unfits itself for doing much for the diseased part; whereas the syringe retains its solution till it reaches the affected place, and then pours a clean shower directly upon it, and upon *no other part*.

Considering these manifest advantages of the syringes, I am surprised that any physician should still use the probang,—especially as one of these instruments, the Nasal Syringe, accomplishes an object which the probang cannot effect at all, not even in a rough way. I have wondered, too, how any parent can allow a child, suffering with croup, to be tormented by having a sponge pushed down its throat, when a syringe would give it so much less pain.

I will mention briefly one or two cases of croup and diphtheria, selected from a great number treated by me for the last few years, where the syringes were successfully used, after several attempts to use the probang had been made, and failed, and where the pain caused by using was so small, and the relief so instantaneous and complete, that the patients were anxious for my return to use it again.

I was called to see a little boy of Mr. R., five years old, who had had an attack of membranous croup some days previous; and when I saw him the voice had sunk to a whisper, and the cough was entirely muffled, so that I had no doubt of the fatal termination of the case, and expressed my opinion to that effect to the astonished parents. The probang had been used by the physician in attendance, which had caused so much suffering that for the two days previous the parents had prohibited its use. It had no doubt increased the irritation, besides nearly causing strangulation.

It was, therefore, with great reluctance that they consented to let



me use the syringe, which I did, to the great relief of the little sufferer, and to the entire satisfaction of the parents.

The strength of the solution of the crystals of the nitrate of silver used was 20 grains to the ounce of water, which I injected freely, once in three hours for the first day, and then two or three times a day for two or three days. His recovery was rapid and complete.

I will now mention the case of a young woman, with diphtheria, where the syringe was used with success.

I was called to see a young lady, who had an attack of diphtheria the day previous. Found her in bed, very much prostrated, breathing with great difficulty, and uttering at every inspiration a croupal sound, which at times was followed by a short, convulsive cough. The face was flushed, pulse 124, small and feeble, and she complained constantly of a sense of suffocation and of great distress in the laryngeal region.

On inspecting the throat, the fauces and the pharyngeal membrane, as far down as it could be seen, presented the appearance of a high degree of inflammation. One of the tonsils was nearly covered with the diphtheric membrane, and the upper and back part of the throat were thickly studded with small white or cream-colored spots.

The physician in attendance had tried first a swab, or mop, as she termed it, and then the probang, which gave her so much pain that he was obliged to give it up. He then gave up the case as hopeless. At my earnest solicitation she consented to the use of the syringe. With a solution of the crystals of the nitrate of silver, of the strength of 60 grains to the ounce of water, I injected freely the fauces and the upper part of the cavity of the larynx. For a few moments the difficulty of breathing and feeling of strangulation was increased, but very soon a large amount of viscid, ropy mucus was discharged. In the course of half an hour after the use of the syringe, the symptoms had improved, the respiration was less laborious, so that in a short time the patient obtained some sleep. I was afterward called, as she thought herself worse, but found that an application of the caustic with a syringe was all that was required. There was no further trouble with the case.



FIG. 87.

These syringes or similar ones can now be bought of any large dealer in surgical instruments. Figure 87 represents the syringes as they lie in a case.

**Mode of Using.** — The glass barrel and piston of my instruments are delicate, but they need not be broken. I handle them with the same ease that I do a spoon in feeding myself, and not in a very dissimilar way. The last three fingers are placed on the under side of the barrel, with the thumb on the upper side, — the index finger being poised over the end of the piston, ready to drive it home at the

proper instant. The motion of the piston should be *quick*, so as to cause the streams to leap out in jets; yet *delicate*, that they may not impinge with too much force upon the diseased surfaces.

They should be rinsed with water immediately after being used. But even with this precaution, a small residuum of the nitrate remains and crystallizes, and after a time partially closes the holes. They must then be picked out with the point of a needle.

When the silver tube becomes detached from the glass, it may be fastened on with common sealing wax; first melting the wax and sticking it around the glass; then heating the silver over a lamp, and pressing it on.

**Amount of Solution to be Used.** — The amount of solution to be used should be small. Half a dram is enough. The piston of the syringe need be drawn up only from an eighth to a third of an inch. Strangling is not often produced by these operations; but to make its prevention still more sure, let the patient be directed to fill the lungs with a long inspiration while the operator is depressing the tongue.

**Strength of Solution.** — The strength of the solution in ordinary cases of chronic folliculitis, etc., should *generally* be about forty grains of the crystals of the nitrate of silver to the ounce of water. But in all *acute* diseases of the air passages, it should be considerably stronger, — varying from one to two drams. A preparation of this strength is powerfully antiphlogistic and sedative. In those cases of *chronic* disease, where the inflammation is of a low grade, and the mucous membrane is in a relaxed, atonic condition, looking either sodden and pale, or of a dark color, like the cut surface of beef some days exposed to the air (as is often the case in throats of literary dyspeptics), then a solution of fifteen to thirty grains to the ounce is sufficient. This strength acts as a stimulant, and is well suited to throats in such condition, but would be *injurious* in high grades of inflammation. Catarrh in the head *generally* requires only about this strength. I am sorry to say, the topical mode of treating throat affections has been in some places injured, in the public estimation, by a lack of knowledge and judgment on the part of the operator, in choosing the strength of his solution.

To determine the proper *frequency of the operation*, also requires judgment and experience. In an ordinary case of chronic disease, the treatment may begin by showering the throat once a day for a week. Then the operation should be repeated three times a week, for a shorter or longer period; then twice a week, and at last once a week.

**Attendant Diseases.** — Among the persons I am treating for diseases of the air passages, many are dyspeptic and suffer with *depression of spirits*. So often does this symptom present itself that I regard it as almost one of the peculiarities of throat disease. Persons thus depressed generally have the dark and dingy look of the face which indicates functional derangement of the liver. They are often



emaciated, nervous, hypochondriacal, irritable in temper, and are exhausted by an excessive secretion of urea. The urine of such persons is always acid, and *loaded with crystals of oxalate of lime*.

An explanation of this fact has been attempted, by supposing that the oxydation of carbon (of which these persons have a superabundance), imperfectly accomplished in inflamed respiratory organs, is vicariously effected in the capillaries of the kidneys,—oxalic acid ( $C_2O_2$ ) instead of carbonic acid ( $CO_2$ ) being the result.

The crystals of oxalate of lime are octahedral in form, and, in the field of a good microscope, are beautiful objects for inspection.

Lawyers, clerygmen, statesmen, and, in general, those who labor hard mentally, with but little bodily exercise, and who have a great weight of care resting on them, are the persons who suffer most from this complication. Generally the inflammation in the throat is of a low grade, and must not be treated with a *very strong* solution of nitrate of silver.

Of course when these attendant diseases exist, something more is needed than the local treatment. For the troubles just described, the treatment for hypochondria and dyspepsia will be proper.

### Elongation of the Uvula.

THE uvula is the small teat-like or pendulous organ which hangs down from the palatine arch, just over the root of the tongue. It is very apt to get inflamed, and its parts becoming relaxed, it stretches out lengthwise, so that its lower extremity sometimes rests upon the tongue. (Fig. 88.) When this happens, it flaps about, backward and forward, and to the right and left, —touching the throat at various points, and by the tickling sensation produced, exciting a most incessant, uncontrollable, and racking cough. Some of the most distressing coughs I have ever heard have been produced and kept up by this cause alone. Many a fatal consumption has begun in this way. When long inflamed, it often gets much out of shape, being sometimes bent nearly double.

**Treatment.** — In some cases, the uvula, thus elongated, may be reduced back to its natural size, by an astringent gargle, composed of an infusion of white-oak bark, with a little alum dis-



FIG. 88.

solved in it (232); but it will generally stretch out again and again, upon the appearance of any fresh cold, and, therefore, the only certain cure is to cut it off.

To do this, take hold of it with a pair of common forceps, and having stretched it down a little, clip it off above the forceps, with a pair of curved scissors. Nearly the whole of it should generally be removed. To take off a part only leaves a stump, which is often more objectionable than the whole organ. Its removal never injures the speech in the least. In many cases of nasal catarrh, this organ is a sort of diseased centre, from which inflammatory action spreads upward into the nasal cavities, and no medicine or power on earth can effect a cure until this offending member is snipped off.

### Acute Inflammation of the Tonsils. — *Tonsillitis*.

THE tonsils are chiefly a collection or mass of small mucous follicles or glands. They secrete a portion of the fluid which keeps the throat moist.

There is a class of persons who suffer about every winter, sometimes oftener, with an attack of acute inflammation of these glands, which causes great suffering for several days. The trouble usually is ushered in by high fever, backache, headache and often by chills; the temperature often reaches to 103° and 104° F.; swallowing is difficult on account of the swollen glands, while pain in the ear is not infrequent. The tonsils are at first swollen, reddened and inflamed; later a whitish patch of secretion forms on the surface of the gland and is distinguished from that of diphtheria by being whiter and less tenacious; if removed, the underlying surface does not bleed as in the case of diphtheria. It is, however, very difficult, at times, to distinguish between the two diseases at first.

Another form of Tonsillitis occurs without patches, and is in reality an inflammation of the substance of the gland itself. This variety, often called *Quinsy*, goes on developing into an abscess, the anterior pillar of the fauces becomes intensely red, swollen and shiny.

**Treatment.** — For the more common variety some antipyretic to reduce the fever and allay the intense aching of the head and bones is properly indicated. For this purpose 10 grains of Phenacetine (for an adult), repeated every two to four hours according to the effect produced, is quite efficacious. Ammonol in same dose may also be used. Some simple astringent and soothing gargle will next be found to render signal relief. Tannin, 30 gr., strong Carbolic Acid (95%), 30 drops, Glycerin, 1 oz., and peppermint water, 3 oz., is an admirable gargle for the average case: this should be used hourly.

Equal parts of Glycerin, Alcohol and Water makes a very soothing gargle, while equal parts of Peroxide of Hydrogen and Water is preferred by many. The diet should be limited in amount and consist only of liquids.



Tincture of aconite in 1 or 2 drop doses together with half teaspoonful of sweet spirits of nitre repeated every hour will help to allay the fever and congestion of the throat, and goes far to prevent pus formation which is usually spoken of as Quinsy sore throat. This abscess, if formed, may be evacuated by the physician, who alone should attempt it, as the region is a dangerous one, being close to the carotid artery and jugular vein, which would cause instant death if cut.

It has been found that Tonsilitis is apt to be recurrent and that he who has suffered once is very prone to have one or more attacks annually thereafter. This class requires constitutional treatment in the intervals as outlined below.

These inflammations are likewise found to be an expression oftentimes of rheumatism, and need corresponding treatment. But the only *cure* is to be found by cutting off the tonsils, after the inflammation has subsided. This will put an end to the attacks at once.

Tonsils which are subject to these periodical attacks of acute inflammation are always more difficult than others to operate upon, as they are almost invariably bound down very tight to the throat, and cannot be raised up for convenient excision.

### Chronic Inflammation of the Tonsils.

IN many of the follicular diseases of the throat, these glands are affected by a chronic inflammation, and are found enlarged, and sometimes very much hardened. In such cases they secrete a thin, unhealthy, irritating fluid, which is spread over the throat, increasing and perpetuating its disease. Much of this secretion finds its way into the stomach, and thence into the circulation.

In the throats of many young persons and children, these glands are permanently so large as nearly to fill the fauces. The respiration of many children thus afflicted is difficult, and when asleep they can only breathe with the mouth open. The defective breathing of such children often occasions contractions of the chest, and thus lays the foundation for consumption. From these diseased parts, the inflammation often spreads upwards, into the posterior nares, and many times enters the eustachian tubes, causing deafness or pain in the ears. Such children often breathe as though they had a bad cold in the head. Their health and safety require an immediate attention to this state of things.

Chronic inflammation of the tonsil, likewise the recurrent acute form, may be dependent on poor blood or rheumatism. Those causes are met by blood-building medicines like Syrup of the Iodide of Iron in 10-drop doses three times daily, cod liver oil, and by some one of the many preparations of iron, arsenic, and strychnia combinations. It is found that generally the excision of the tonsil may be averted by visiting the surgeon, who will hunt out the little crypts or holes with which the gland is studded, and by gently cutting the narrow

bridges which separate these holes, destroy these cavities. These little holes retain small particles of food and decomposed secretion, which after a while, if allowed to remain, set up a follicular tonsillitis. The size of the gland is thus greatly diminished and the little secreting follicle destroyed. Many a little sufferer can thus be spared the harsher method of excision, and bear with good grace, especially if cocaine be used, what otherwise might be a painful and bloody operation. But, as has been said, excision in many cases must be resorted to.

**Curability of Throat Diseases.** — I have dwelt somewhat upon the preceding forms of throat disease, because they prevail to a fearful extent, and are, in thousands of cases, but the first stages of fatal disease of the lungs.

If not connected with lung disease in the *beginning*, my experience in treating them enables me to say, emphatically, they are generally *curable*.

But patients often put the question to me — “If cured, will I ever have the complaint again?” My answer is — “Unless I can plant in your constitution a better protection than your Maker put there at your creation, you will of course be *liable* to a second attack.” But then, where the lungs have been entirely free from disease, I have never yet seen a case of simple throat complaint relapse and become *dangerous* after proper treatment with the syringes. Let not those, therefore, who have been benefited, but not entirely cured by this treatment, undervalue what has been done for them. Even in such cases, the advantage derived to them amounts to just the value they attach to *the continuance of life*.

**Dangers of Delay.** — In closing these remarks, let me warn the reader against the dangers of delay. Many of those who finally seek medical attendance in these complaints, first try all nostrums, and tamper with their disease till the case is either critical or hopeless. Too many wait till they are near enough to the engulfing whirlpool to hear it roar, before they seek in any practicable way to escape its dangers.

Many persons neglect a slight inflammation of the pharynx, which might have been cured in a few days, but which, from long neglect, has gradually crept down the windpipe, spread over the widely distributed mucous lining of the bronchial tubes, and thus become curable only in a partial degree, and after long and tedious treatment. Hundreds of persons are now suffering from slight attacks of this sort, who might be rid of the affliction in a week or a fortnight, but who will either carelessly give it no attention at all, or resort to useless nostrums, until it has run through its primary stages and invaded the constitution, and will finally die of some of the forms of pulmonary disease.



### A Cold. — Influenza.

A SLIGHT attack of the disease about to be described, affecting only here and there a person, and lasting only for a few days, is called a *cold*. When it affects a large part of the community at the same time, lasting many days, or even weeks, it is then an epidemic, and passes under the name of *influenza*. In this latter form, it sometimes spreads over a whole country, and has at times, as in 1832 and 1894, extended to nearly the whole civilized world. It often shows marked severity in its progress, and leaves serious results behind.

**Symptoms.**—A tingling, with dryness, and a sense of fulness in the mucous membrane of the nose, are among the first indications of an attack of this complaint. Sneezing is a common symptom. Soon pain is felt in the forehead, and breathing through the nose becomes difficult. The eyes are red and watery, the throat is sore; there is a dry cough, hoarseness, thirst, general lassitude, chills, and a desire to get near the fire. The mucous membrane of the nose, throat, windpipe, and breathing-tubes is inflamed, red, swollen, and sometimes painful.

In a short time, water begins to run from the nose and eyes, and the cough becomes a little more moist. There is also a slight discharge from the throat and tubes, which gradually increases, and, at length, as the disease declines, and becomes less acute, the expectoration is thick and yellow.

Aching of the back and limbs, thirst, loss of appetite, flashes of heat, and chills whenever the patient is exposed to air a little cooler than he is accustomed to, are almost constant attendants upon the disease.

**Causes.**—It is not always easy to say what the causes of this complaint are. Frequently, it can be traced to an improper exposure to cold or dampness; but in a great majority of cases, especially when it takes the form of influenza, the causes are not obvious. They probably exist in some peculiar states of the atmosphere, and in a depression of the nervous system.

The influence upon disease of the different degrees of density in the air which surrounds us, and of other circumstances affecting it, have not been much studied. Some valuable facts will be drawn from this source before many years. The putting upon the body, or taking from it, several tons of pressure every time the barometer rises or falls, must have, of itself, no small influence upon its health. The comparatively new science of Physical Geography, by spreading before us its interesting facts in regard to temperature, storms, atmospheric currents, etc., is opening the way for the physician to learn a great deal more about the causes of disease than he now knows.

**Treatment.**—In mild cases, only the most simple treatment is required,—such as remaining in the house for a few days, soaking the

feet in warm water, taking a gentle sweat, drinking warm infusions of flax-seed, mullein, slippery elm, or warm lemonade, and taking only a spare vegetable diet. If the bowels be costive, some gentle physic (34), (41) may be used. A laxative drink (132) will likewise be useful.

At the outset, especially when the nose runs water, a small dose of atropia,  $\frac{1}{200}$  grain, taken every two hours till the throat is dry, will entirely arrest the disease at this point. The coryza pill found at the druggists' is a more valuable remedy still.

When the attack is more severe, sweating must be induced by decisive measures. This may be affected by the spirit vapor-bath, or by putting the patient in bed, putting bottles of hot water to the feet and sides, and administering warm drinks, and the compound tincture of Virginia snakeroot. Five drops every hour of the tincture of veratrum viride will often cause very free perspiration, and will reduce the inflammation upon the mucous surface.

An emetic is sometimes very useful. To produce vomiting, use the powder of ipecac, ten to twenty grains, or the compound tincture of lobelia.

It soothes the inflamed mucous surfaces very much to inhale the vapor from half a pint of hot water, with five drops of tincture of veratrum viride, or the same amount of the tincture of aconite root.

If the cough is severe, use the preparations recommended under bronchitis and consumption.

In the latter stages of the disease, if there be debility, — as there generally is, — quinia, iron, nux vomica, etc. (75), should be taken; or, to support the nervous system, the extracts of scullcap, and bone-set, and the sulphate of quinia (81) will be found useful. At this stage of the complaint, the diet should be more liberal and nourishing.

The patient should not venture into the open air until the unpleasant sense of chilliness, peculiar to the disease, ceases to be produced by exposure.

### La Grippe.

THIS is a variety of influenza with which the world has become well acquainted within the last few years. Its history is interesting and its symptoms and results are severe and annoying. It is one of the most severe forms of catarrhal disease of the nose or throat with which we are acquainted. It owes its origin to a germ which found its birth in the filth and pollution of eastern Europe, and has visited the globe with terrible ravages on several occasions since the Middle Ages. It spreads by travelling the most frequented paths of commerce, and attacks those in a depressed state of health. The varieties of la grippe are as numerous as that of any other disease. The *catarrhal* form is much like that of ordinary head influenza, only it is more severe and prostrating; the *bronchial* assumes the influenza type, at first, but soon attacks the lungs and sets up a severe, prolonged and



harassing bronchitis; the *intestinal* variety, besides producing the general symptoms of malaise, fever, cough, severe aches and pains, gives rise to a diarrhoea which lasts many days and is very debilitating; the most common variety, however, is the *rheumatic*, which is ushered in by chills, fever, muscular pains, coryza, cough and general rheumatic pains. The characteristic feature of all of these forms is the great prostration which accompanies these symptoms and the obstinacy with which it clings to the patient.

The sequelae of the disease, though much exaggerated, are numerous. The aged are often left infirm with heart weakness, the young with lessened resistance to disease, and the middle-aged with chronic coughs.

Many an undiscovered disease has passed unnoticed under the disguise of "la grippe." It has no doubt served as a broad mantle to cover our ignorance of real disease and been made an easy refuge for the complaining; still its affects at times cannot be over-estimated, and death has not infrequently resulted.

**Treatment.**— The onset is to be met with large doses of quinine, say 10 grains on retiring, by phenacetine and salol, 10 grains each, taken with some hot lemonade on retiring. This latter may be repeated every three hours. The coryza is checked by small repeated doses of belladonna, camphor and quinine, as found in the coryza tablets bought at the druggist's — one taken every two hours till the throat is dry, then once in four to eight hours. The debility is to be met by tonics.

### Acute Inflammation of the Epiglottis.

THIS is the disease by which our country lost its most loved and distinguished citizen, George Washington. This complaint was not understood at the time of his death, — the intelligent physicians who attended him supposing it to be inflammation of the windpipe. From their very clear description of the symptoms, we now know it to have been an acute inflammation of the epiglottis and glottis.

From the rapid inflammation of the epiglottis, water is effused into this cartilage, so as to puff it up, and prevent it from shutting down in the act of swallowing. The lips of the glottis are swollen from the same cause, and brought so near to each other that air passes through to the lungs with great difficulty, and unless relief is soon obtained, the patient is strangled.

**Symptoms.**— The disease begins with a severe chill, accompanied with some pain, and a sense of stricture or tightness in the upper and fore part of the throat. There is cough, with difficult and sometimes painful swallowing. These symptoms are soon followed by quick and laborious breathing. Speaking aloud is from the first difficult, and soon becomes impossible. As the complaint runs its rapid course, the breathing grows more difficult, and death soon results from complete strangulation.

**Treatment.**— Apply immediately to the parts a strong solution of nitrate of silver. The solution should be of the strength of ninety to one hundred and twenty grains to the ounce of soft water. It should be applied every hour or two till the feeling of suffocation subsides, and should be done with the laryngeal shower syringe, though if this is not at hand the sponge probang may be used.

While this local treatment is being employed, liberal doses, from five to twenty drops, of tincture of veratrum viride should be given every hour, watching the effect, and discontinuing when the pulse sinks too low.

Hot fomentations applied externally, and filling the room with steam, as recommended in cases of croup, would be useful.

### **Mumps.** — *Parotitis.*

THIS disease appears most often among children; but as it is not confined to them, I have not placed it among their complaints.

**Symptoms.**— It begins with soreness and stiffness in the side of the neck. Soon a swelling of the parotid gland takes place, which is painful, and continues to increase for four or five days, sometimes becoming very large, and making it difficult to swallow, or open the mouth to receive food. After the fourth or fifth day the swelling subsides, and disappears in from seven to ten days.

Both glands generally swell about the same time, but sometimes the swelling appears in one only after it has subsided in the other, and occasionally the swelling is wholly confined to one side.

When the swelling is great, there is heat, and sometimes fever, with dry skin, quick pulse, furred tongue, constipated bowels, and scanty and high-colored urine.

The affection is sometimes translated, as we say; that is, in females, the breast swells, and in males, the testicles become swollen and painful. This accident generally happens in consequence of taking cold from some imprudence.

The disease is contagious; that is, it is communicated from one person to another.

**Treatment.**— In mild cases, very little treatment is required. Keeping the face and neck warm, avoiding exposure to cold and damp, drinking warm infusions of balm, spearmint, or sage, and apply a poultice of flax-seed over the glands until the patient is fully relieved; or the compound powder of jalap, if there be costiveness, is about all that is required. The diet should consist of rye hasty pudding, or brown bread and sweetened water.

If the case be severe, and other glands swell, physic must be freely used, leeches must be applied, and cooling lotions, or poultices. Sweating must also be induced by the compound tincture of Virginia snakeroot, or by a vapor bath.



In young girls mumps often attack the ovaries and make the invalid a great sufferer for a few days ; the testicle of the male is similarly affected at times. These complications call for soothing applications and rest in bed.

# DISEASES of the CHEST



## DISEASES OF THE CHEST.

(Also see **Anatomy of the Lungs and Respiratory Organs.**)

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### **Consumption.** — *Phthisis.*

As it was asserted a short time ago that the incurability of consumption was an acknowledged fact, it is encouraging to know that in many instances now we may effect a cure even under relatively poor conditions, also that many persons have the disease and get well of it without their knowledge. This is proved by the large number of cases that have come to autopsy for death from some other cause and the diseases of the lung which has healed are discovered. If the disease can be taken in hand early enough and the constitution of the person's body protected from these ravages by appropriate climatic conditions, good food, and possibly a little medicine, we are justified in thinking that a favorable outcome will occur. It is necessary to keep the weight of the person maintained and especially the digestion more than good.

Marriage should be avoided by anyone afflicted with the disease, as the bearing of children on the part of the woman will often cause the disease to take a fresh start and the extra effort required by the husband to maintain his family will do the same for him. It is only fair to the friends surrounding the patient that precautions should be taken to prevent the contraction of this disease from one whom they are trying to help, as the disease is propagated by the increase of the germ known as the bacillus of tuberculosis; we must destroy this organism as soon as it is expelled from the person.

In the expectoration these germs are present in very large numbers and in singing and coughing they are sent into the air to possibly be inhaled and land on new soil for future trouble. The kiss of a consumptive is very dangerous and even the use of toilet articles which have been used to wipe the nose or mouth is dangerous until they have been boiled. All expectoration should be received in articles which can be burned before they become dried, and if the person is confined to the house they may be received in an earthen vessel which holds a solution of disinfectant such as carbolic acid, 1 part of the pure acid to 20 of water, or corrosive sublimate, 1 part to a 1000.

It is for this reason that the boards of health of all the large cities of the United States and Europe within the past few years have passed ordinances prohibiting expectoration of sputum on the sidewalks, floors of cars, at stations or public places, and the disease is now reported to

them by physicians under penalty of fine in the same manner as small-pox and diphtheria. Sunlight is another prevention, for this germ cannot live in the rays of the sun and this is taken into account in our treatment of the patient, as good air and sunlight are perhaps the most important aids in helping us to get the better of the disease.

**Methods of Examining the Chest.** — Before speaking further of consumption, I propose to do what has never been done, namely, to instruct the general reader very briefly in the method of examining the chest to learn the existence of disease. Perhaps this will be considered a departure, in some slight degree, from my purpose to make this entire book intelligible to the general reader. If so, my reply is, that there are *many* school teachers, mechanics, masters of vessels, and farmers, who have inquiring minds, and sagacity enough to learn the physical signs of chest-disease, and to make them, in many cases, practically useful; and that even readers of little reflection cannot fail to comprehend a portion of my explanations.

**Position of the Patient.** — In performing percussion upon the front of the chest, the patient should be required to sit in a square position, with the arms hooked over the corners of the back of the chair, and the head thrown a little back.

**Instrument with which to Thump.** — The index and middle fingers of the right hand are to be brought together, into a line, and used as the percussing instrument. The blow given with these is to be *smart* and *quick*, rather than heavy.

**Medium to Thump Upon.** — Either the index or middle finger of the left hand is to be pressed firmly upon the surface of the chest to be percussed or struck, and thus used as a pleximeter.

**Auscultation.** — Listening for the purpose of hearing within the chest the sounds produced by breathing, talking, coughing, etc., is called auscultation.

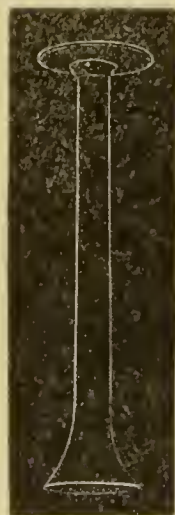


FIG. 90.

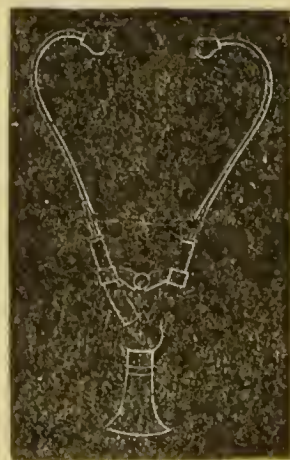


FIG. 91.

**Instruments with which to Listen.** — The naked ear is generally considered best for hearing low and delicate sounds; but for hearing



loud and rough ones, it is not so good as the stethoscope, represented by Fig. 90. A still better instrument is the double-eared stethoscope, Fig. 91. It magnifies the sounds very much, and is apt to confuse an examiner not accustomed to it; but when the ear is once familiar with it, the aid it affords is very valuable.

The examiner should pass from side to side, continually *comparing* the sounds upon one side, with those upon the other.

The patient must be calm, and the examiner in no hurry.

**Healthy Sounds.** — To become skilful either in percussion or auscultation, the examiner's ear must first be trained to healthy sounds.

These are best heard in the child, in whom they are louder than in the adult.

In describing the healthy sounds in the different regions of the chest, I shall refer the reader constantly to Figs. 92 and 93.

**Clavicular Region.** — This, in Fig. 92, is represented by 1, 1. Upon thumping upon the collar-bones, the sound given out at the breast-bone end should be very clear; less clear in the middle; and dull at the shoulder end.

**Subclavian Region.** — This is represented by 2, 2, and lies between the collar-bone and the fourth rib, on both sides. It covers a considerable portion of the upper lobe of the lungs. The sound upon striking this place should be very clear.

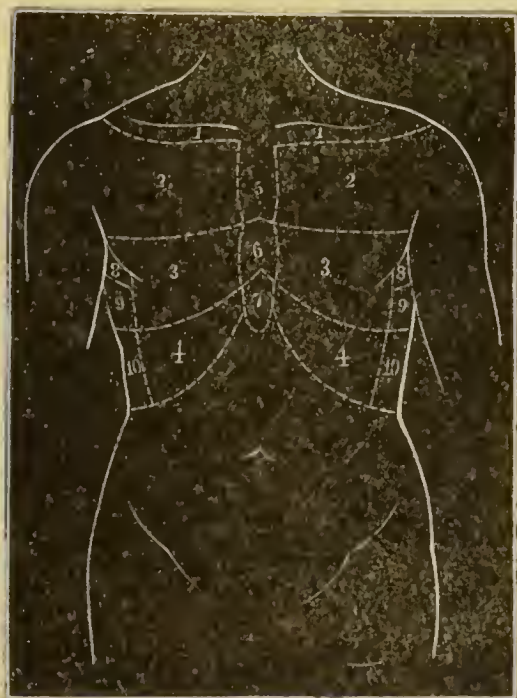


FIG. 92.

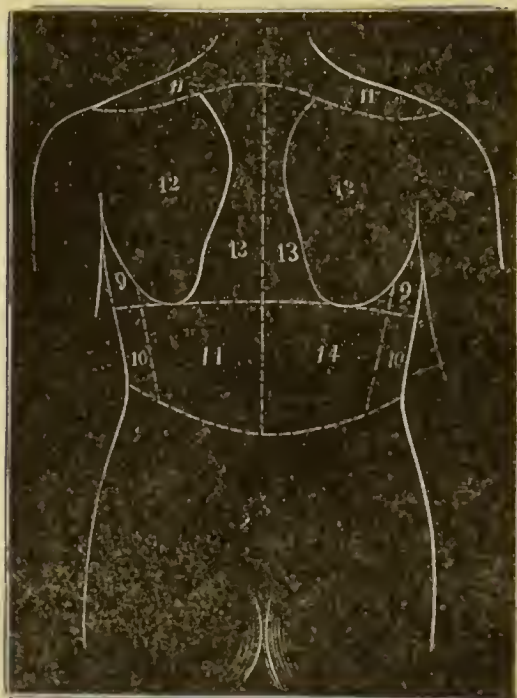


FIG. 93.

**The Mammary Region,** represented by 3, 3, extends from the fourth to the seventh rib, on each side. In the upper part of this region, the healthy sound is clear; but at the bottom of it, on the right, the sound is deadened by the liver; on the left, by the heart.

**The Infra-Mammary Region**, 4, 4, lies between the seventh rib and the edge of the cartilages of the false ribs. On the right side, the liver makes the sound dull; but under the left side lies the stomach, which is hollow, and the sound is generally quite loud.

**In the Sternal Region**, 5 6, 7, which covers the breast-bone, the sound is generally clear.

**The Axillary Region**, 8, 8, is in the arm-pits. In this the sound should be clear.

**The Lateral Region**, 9, 9, is immediately below the above, and yields, likewise, a clear sound.

**The Lower Lateral Region**, gives a dull sound on the right side, and on the left a very hollow one.

Fig. 93 represents the *back* part of the chest. In looking at this, we see the

**Acromial Region**, represented by 11, 11. In this space the sound is dull, but it has not much meaning.

**The Scapular Region**, 12, 12, covers the part occupied by the shoulder-blades. It gives rather a dead sound.

**The Intra-Scapular Region**, 13, 13, lies between the shoulder-blades, on each side of the back bone. If the patient's arms are crossed, and the head bent forward, a clear sound will be obtained.

**The Dorsal Region**, 14, 14, covers the base of the lungs, and, in health gives, a clear sound.

**Observation.** — If, now, on thumping upon the chest, we find a dull, dead sound in any spot where a clear one ought to be yielded, we are to conclude that underneath there is not the usual quantity of air; but we cannot tell *merely* by percussing, whether tubercles are deposited there, or the lung has become solid by inflammation, or water has been poured out into the cavity of the pleura. *This* point must be determined by auscultation, etc., to be explained gradually as we go along.

**Auscultation of Breathing.** — On applying the ear or the stethoscope to the chest, two sounds are heard which immediately succeed each other, — the louder is produced by the ingoing breath, or inspiration; the weaker by the outgoing breath, or expiration. These sounds will be further explained as we go along.

**Auscultation of the Voice and Cough.** — The chest of a healthy person speaking communicates to the ear no distinct sound, but only a vibratory sensation, called, in technical language, the *pectoral fremitus*.

Over the larynx and windpipe, the examiner may hear natural pectoriloquy; between the shoulder blades, in the space corresponding to the roots of the lungs, natural bronchophony.



**Philosophy of Chest Sounds.** — The fullness and clearness of sound upon percussion, depends upon the amount of air in the chest.

The sounds called *breathing murmurs*, are caused by the expansion and contraction of the air-cells or vesicles, as the air passes in and out; hence they are called *vesicular* murmurs.

The friction of the air against the sides of the windpipe and large bronchial tubes causes the blowing sound heard in those parts.

In children a larger amount of air enters the lungs, and the air vesicles are expanded with more force; hence their breathing has a louder sound, which is called *puerile* respiration. This kind of breathing, heard in the grown person, is a sign of disease.

The lung tissue is a bad conductor of sound; and the voice is accordingly heard only over those parts where large bronchial tubes are near the surface; heard elsewhere, it indicates disease.

**Division of Consumption.** — Consumption may be divided into two kinds, the tubercular and the bronchial. The former has a constitutional, the latter a local origin.

### First Stage of Tubercular Consumption.

**Physical Signs.** — Dullness of sound on and under the collar-bones. Inspiration shortened; expiration augmented both in duration and intensity. This dullness often first perceived in armpits, or at base and back of lungs.

Occasionally a pulmonary, crumpling sound. Dry, crackling rattles.

The resounding of the voice increased at the top of the lungs.

**General Symptoms.** — A sense of weariness and languor.

Occasionally, slight, flying pains about the chest and shoulders.

A peculiar sensitiveness to the effects of cold.

Breathlessness on moving quick, or ascending a hill or stairs.

In many cases a blue lividity of the lips and roots of the fingernails, and coldness of the hands and feet.

Occasionally, in females, even at this early stage, a cessation of the monthly turns. These usually stop later in the disease.

**Observations.** — The formation of tubercles almost always begins at the top of the lungs. Laennec and others thought they appeared oftenest on the *right* side first; Louis, Andral Watson, Sir James Clarke, and others, believed they appeared more often on the *left* side. Recent investigations show that they were all mistaken. Tubercles appear first about as often upon one side as upon the other.

The pulmonary crumpling sound is caused by a mechanical obstruction to the expansion of the lungs. It is generally heard only during the drawing in of the breath. The sound is like that produced by blowing upon very fine paper.

## Second Stage.

**Physical Signs.** — *Marked* dullness of sound on the collar bones, and extending below them.

Inspiratory murmur *diminished* in duration and intensity; expiratory murmur *augmented* in both.

In upper lobes of lungs, moist, crackling rattles, succeeded by mucous rattles. Also bronchial respiration, or tubular breathing.

In lower lobes of lungs, puerile respiration.

Sounds of the heart heard under the collar bones.

Bronchophony heard in the same parts as bronchial respiration.

**General Symptoms.** — A quickened pulse; slight fever towards evening, oftentimes amounting to quite high fever.

Great susceptibility to the effects of cold, and liability to take cold easily.

Bowels generally costive; oftentimes seat of pain.

The eye has a peculiar whiteness and lustre.

The skin and mouth become dry in the afternoon; chills occur about midday, followed by fever, during which the cheeks are flushed.

As the second stage advances to its close, a dry, burning heat afflicts the palms of the hands and soles of the feet.

Night-sweats occur at this time.

**Observations.** — A hollow, elastic body, containing air, gives, when struck, a clear sound. The dullness of sound on percussing the chest, arises from the absence of air in the air-cells, — these having been pressed together, or obliterated by the deposit of a mass of tubercles. The destruction of these cells causes the cessation of the respiratory murmur.

This stage of the disease is often accompanied by an inflammation of the mucous membrane lining the air-tubes. The air, pushing its way through the mucous secretions in these tubes, forms bubbles, the bursting of which causes the rattle. The crepitant rattle is produced by inflammation around the tubercles. The moist, crackling rattle is caused by the softening of the tubercles.

The lungs, rendered more solid by the deposit of tubercles, become better conductors of sound; and this causes the beating of the heart to be heard as far off as under the collar bones.

Bronchial respiration gives the idea of air blown through a tube; cavernous respiration, of air passing into a large enclosed cavity.

## Third Stage.

**Physical Signs.** — In this stage cavities are formed. If the cavities be small, and considerable tuberculated lung surrounds them, the sound, upon percussion, is still dull.



If the cavity be large, and near the surface, there is occasionally a tympanitic sound with musical tone.

Sometimes a sound is heard like striking a cracked pot.

Gurgling; cavernous rattle; cavernous breathing; amphoric breathing; now and then, metallic tinkling; pectoriloquy; cavernous cough.

**General Symptoms.** — Great loss of flesh, and weakness; diarrhœa and night-sweats; swelling of the feet and legs; sore mouth; and raising of matter with specks of tubercle in it like crumbs of cheese.

**Observations.** — The gurgling rattle is caused by air displacing liquids, and the formation and bursting of bubbles. It resembles the sound produced by blowing through a tube immersed in soap-suds.

Cavernous breathing is nothing more nor less than the sound produced by air, breathed in and out, entering and retiring from a cavity. The air appears, sometimes, to one listening with the stethoscope, as if it were sucked into his ear during inspiration, and blown back again during expiration.

Amphoric respiration is simply an *augmentation* of cavernous breathing, and results, of course, from an increase of size in the cavity.

In pectoriloquy, words uttered by the patient seem to pass through the stethoscope into the ear of the listener. The cavity should be empty, moderate in size, and have dense walls, in order to furnish the best specimen of this sound.

Air suddenly driven backward through the windpipe, and out of the mouth and nose, by smart raps upon the chest over a cavity, gives the sound of the cracked pot. It is best heard when the patient's mouth is partly open. The same sound is produced, on the same principle, by locking the fingers of the two hands, and joining the palms, so as to leave a small space or cavity between them, and then expelling the air from that cavity, by gently striking the back of one hand upon the knee.

**Causes of Consumption.** — The human constitution, as shown by Liebig, in his profound work on Animal Chemistry, is governed by two forces, the nervous and the vegetative. The former disposes the particles composing the body to a state of motion; the latter inclines them to a position of rest.

In vegetative life there is motion in one direction only, so to speak; that is, motion which tends to the opposite of motion, namely, rest. In vegetables, whose life is wholly under this power, there is no waste; for here, all ultimate particles, having once taken a place of rest, remain undisturbed. In a tree, a layer of matter once deposited, always remains. Hence there is *growth* as long as the tree lives. There is no power to break up and destroy.

But in the animal body there is motion in two directions, or a circuit of motion. Particles which under the vegetative force have been put to rest, are perpetually being displaced by the nervous energy,

and reduced to unorganized amorphous compounds, to be burned in warming the system, or cast out by the several excretory processes.

So constant is the action of these two forces, that John Hunter compared the human system to a whirlpool, into which the particles of matter are perpetually poured, under the influence of the vegetative power, and out of which they are as constantly whirled by the nervous force.

By a little reflection upon these antagonisms, the reader will see that it is just when the vegetative force transcends the nervous, that the body increases in weight, and acquires that state in which the blood corpuscles abound, and the tendency, if to disease at all, is to that of the inflammatory kind. It is the tonic condition of the system. Nutrition is more rapid than destruction. New particles are laid down faster than old ones are taken up. The body *grows*.

On the other hand, when the nervous force overmasters the vegetative, when the outward or centrifugal motion of the whirlpool prevails, then it is that the body is attenuated, the blood thinned and made serous, and the consumptive or atonic condition is established. *Now*, there is too much motion. The nutritive particles, instead of tending to a state of deposit for the re-supply of waste matter, become fugitive in their habits, perpetually fleeing, like convicts escaped from prison. Introduce this power, in excess, into the vegetable kingdom, and the matter deposited upon the tree, instead of remaining to swell its bulk, would be driven off by the nervous force; and the tree, instead of growing, would be annually *lessened*, become sickly, and die of consumption.

In Tubercular Consumption, the system is like a field deluged by a flood; nothing can take root. The repeated shocks of the nervous battery sent to the absorbents so quicken them in their work of removing waste matter, that they dislodge much which is not yet worn out, and assist in casting out of the system not a little designed to be used in its renewal. A healthy deposit is thus prevented, and nutrition is at an end. The nutritive arteries, those little builders of the human frame, are overmastered by the stimulated lymphatics; the constructive material is wrested from them, and borne beyond their reach, and the body wastes from want of nourishment. The blood becomes thin and watery; and from the increased serous portion, chiefly albumen, are deposited upon the lungs and other tissues the albuminous tumors called tubercles.

Here is found the cause of that peculiar smallness of bone and muscle, and thinness and tallness of person, so peculiar to consumptives. The absorbents, under the power of a very active nervous system, take down "the house we live in" faster than the nutritive arteries, confused by the motion around them, can effect its reconstruction. It is simply an unbalancing of the antagonistic forces, which build and pull down our earthly tenement. The men that demolish are more numerous and better fed than the artisan builders



It is this destructively nervous force which gives to consumptive persons their proverbial mental activity; which causes them often to dazzle the world with the splendor of their gifts, and to bless their friends with the warmth of their affections. They are usually the *choice spirits*, the idols of their relatives, and the favorites of the community in which they live. Their mental movements, and the exercise of their affections, are characterized by brilliancy and warmth. Of all persons, they are best fitted to enjoy life, and to impart happiness. Loving all, they are by all loved in return. They are specimens of partially etherealized humanity, stepping lightly across the earth, to whom friends passionately stretch out their arms, and embrace — their shadows!

These views will appear the more reasonable, if we consider that in children the vegetative power is very active, while the nervous energy is comparatively weak. The preponderance of the former over the latter causes the rapid growth of children. The little arterial builders work faster than the lymphatic demolishers. This explains why so few children die of consumption.

But from the age of seventeen to thirty-five, when the vegetative power is losing something of its extraordinary activity, and the nervous force is showing its highest capabilities, — then it is, as this theory indicates, that tubercular consumption does its dreadful work, — then, that the outward world of this physiological Maelstrom casts upon the shores of mortality so many thinned, exhausted, and lifeless human forms. More than three-fourths of all who sink under this disorder die between the ages just named. The brain, between these points of time, acquires its full size and force.

This disease prevails most, too, in those countries where an enlightened civilization gives to the nervous system its fullest development, as in Great Britain, France, and the United States, and in those where the nutritive process is most retarded by a relaxing climate; and it is scarcely known among those people who are but little enlightened and have small brains, and among those who live in high and invigorating latitudes. As the most enlightened, however, are generally found in temperate climates, and those with the least cultivated brains in low latitudes, the rule is not perfectly explained by facts; yet it shows itself sufficiently to establish its validity, and to afford another proof of my theory.

### Bronchial Consumption.

THE persons exposed to bronchial consumption are generally of an opposite habit to those described above, — having the nervous force, in health, well subordinated to the vegetative, the assimilation good, and the blood well supplied with red globules. They have usually a full habit and an active circulation. The absorbents, and other vessels in the lungs, working in the midst of a large amount of caloric

evolved by an energetic respiration, often take cold, which brings on lung-fever and pleurisy, and these lay the foundation for the ultimate destruction of the lungs. For the same reason, the skin of this class of persons becomes diseased, and more often the inner skin, or mucous membrane, and most often that portion of mucous membrane which goes down into the lungs and lines the air-tubes. It is inflammation of this which constitutes bronchitis, and which lays the foundation for true bronchial consumption.

As that class of persons who are exposed to the tubercular form of the disease suffer a general loss of carburetted hydrogen in its several forms, colliquative diarrhœa, sweats, increased breathing, and all conditions that carry fat out of the system, so those who suffer from attacks of the bronchial type of the disorder are generally afflicted with the opposite condition. They have too much carbon.

It is well ascertained that carburetted hydrogen, accumulated in the system, acts as a poison. And that class of bilious persons who are subject to this disease often have their *excretions* badly performed. For this reason, carbonaceous compounds accumulate in the system, and give rise to the symptoms of morbid poison circulating in the blood. This led Dr. Madden to suspect the presence of such poison in the blood of all consumptive persons. He saw the evidence of it in numerous cases, and not distinguishing the one class from the other, he inferred its presence in all.

### Constitutional Difference.

THE constitutional difference between the two forms of consumption appears to be this: the tubercular type is usually attended, in its origin, by a tolerably good state of the digestive function, in connection with bad assimilation; while the bronchial form generally has its foundation laid in connection with bad digestion, accompanied with healthful assimilation. In the former case, the food is well digested, the pabulum is properly prepared, but the nutritive arteries do not use it for renewing the tissues. In the latter case, the digestion is bad, the pabulum poorly elaborated; but the re-constructive vessels, under the control of a well-developed system of organic nerves, use it to the best advantage. In the one case there are good brick-makers, and lazy brick-layers; in the other, the reverse.

It happens, however, that before the fatal close of the disease, tubercular patients usually become afflicted, more or less, with bad digestion, and bronchial patients with defective assimilation; so that, in the end, they present us with much the same class of symptoms. Starting from opposite poles in life's celestial sphere, they meet at the culminating point of death, and disappear under identical aspects of the heavens.



### Exciting Causes of Tubercular Consumption.

THE preponderance of the nervous force being the state which predisposes to disease, whatever unduly excites the nervous energy invites an attack.

These causes relate, mostly, to the *prolonged exercise of the intellect, the passions, and the sentiments.*

Few are aware of the mischief done by excessive stimulation of the mind during the most active period of life, — especially if the muscular system be left half developed. Here is where ambitious students commit great errors.

The constant plying of the mental powers, in the present modes of educating children, leads to a dreadful abridgment of human life. Better to train the bodily powers first, and let the mental culture come in later time. He who would build a lasting structure must lay a solid foundation.

The age in which we live abounds in the causes of excitement. The world is trembling with excess of mental life. The pine trees burned by the steam-engine are scarcely more numerous than the human constitutions consumed by the train of thought it has set on fire.

Nor are the passions and sentiments less exercised, or less destructive.

Briefly, the causes of consumption embrace all those things which bring a destructive force against the digestive and assimilative functions, as insufficient and improper food, debaucheries, night-watches, sedentary habits, anxiety of mind, etc.; and those which act injuriously upon the breathing organs, as impure air, inflammation of the lungs, pleurisy, measles, whooping cough, etc.; and such as disturb the sweating process, as insufficient clothing, sudden changes of temperature, sleeping in damp sheets, etc. These exalt the nervous force, or depress the vegetative, or inflame the mucous lining of the air-tubes, or the substance of the lungs, or the membranous sack which encloses them, so as to induce one form or other of consumption on the principles I have explained.

The immediate cause of consumption we know, now-a-days, to be due to a deposit of tubercles either in the neighborhood of the vocal cords, the upper parts of the lungs, or, not infrequently, at the bases of the same. These tubercles contain a germ called the *Tubercle Bacillus*, which can only be seen with a high power microscope, and then only after being stained with certain aniline colors which they absorb. These little germs are of the rod-shaped variety of bacilli, and appear under the microscope as little straight lines or rods about  $\frac{1}{16}$  inch in length. Their presence in the sputum of a person means tuberculosis of some part of the air-passages; when they are associated with the presence of yellowish fibres (seen under the microscope) they are a proof of the deposit being in the lungs

proper. The examination of one's sputum, therefore, in the early part of any prolonged and suspicious cough, becomes an absolute necessity, since thereby one is made aware, in the earliest stages, of this dreadful disease, and an opportunity offered of attacking it at once in its incipency. This modern discovery has given rise to much experimentation in treatment with the aim in view of killing out the germ. Robert Koch of Berlin announced to the world, a short time ago, that he had discovered an agent, which he called *Tuberculin*, that would eradicate these death-producing germs, but time has shown his efforts to be unsuccessful as yet, although promising of great results in the future. These germs are contagious in character, so that we now can explain why many contract consumption in whose ancestral blood there never existed any tubercular taint.

We know that husband may impart the disease to wife and mother to daughter if only the system is in a receptive state to offer a lodgment to the germs. These tiny but most enduring bacilli retain their life for an indefinite time in the midst of dust and other dried secretions, so that a practical point is that all persons suffering from tuberculous diseases should be exceedingly careful where they spit and with whom they sleep. To raise the sputum into small paper cups which may be burned is a common and very prudent custom.

This discovery, while not disproving the old theory of heredity, nevertheless explains many a case of acquired Phthisis, and clears up many an old-fashioned theory.

These are indisputable facts from which the medical profession at present hope to derive practical benefit by the discovery of some germicide which may be applicable and safe for internal administration.

**Can Consumption be Cured ?** — In many cases it can. It may be cured, first, by the absorption of the tubercles. The celebrated John Hunter shows, in his work on the blood, that the absorbent vessels have a sort of *elective affinity*, by which they take up and remove "all adventitious new matter, as tumors" (tubercles are albuminous tumors), more easily "than those parts which were originally formed." Were this not so, an activity in these vessels equal to the removal of tubercles would cause them to waste all the tissues, and aggravate rather than cure consumption. Probably this does occur where proper hygienic means are not used to quicken the excretions. This hygienic treatment, to be spoken of hereafter, is not generally employed, — certainly not as effectually as it should be. Here is the source of Laennec's fatal remark, so often quoted and so widely endorsed, that nature's efforts towards effecting a cure *are injurious*, and those of art are useless." Laennec's position cannot be true, if Hunter's statement is correct. If the absorbents, by an elective instinct, take up adventitious matter rather than the natural tissues, then the reason why they reverse this rule in consumption is, that by a weakened state of the constitution, the ultimate particles *are not*



*well put together*, and are more easily taken apart than those of the adventitious tubercular tumors ; and if we would restore these vessels to their natural activity, we must improve assimilation, and knit the unloving molecules into a firmer brotherhood. We must make the flesh *hard*, so that the absorbents cannot pick it to pieces. Do this, and “nature’s efforts to effect a cure” will *not* “be injurious.”

A second form of cure is the reëstablishment of the assimilative function, the building up of the general health, the arresting of the tubercular deposit, the reducing of tubercles already formed to an indolent state ; and then, by a strict observance of the laws of health, keeping them in that condition through life.

A third mode of cure is the healing of the cavities after the tubercles have softened, broken down, and been expelled in the form of expectoration.

A fourth method of cure is a change of tubercles to calcareous matter. These *calcareous* tubercles, Laennec says, “are consequent to tuberculous affections *that have been cured*.” And Andral, at one time, hoped to learn how to effect cures by changing tubercles to “the calcareous phosphate.”

I have had several cases of cure by this last method, and have quite a collection of calcareous substances which my patients have coughed up,—one of which was raised in my presence by a lady who was a few years before in hopeless consumption, but is now in good health.

**Treatment.** — This should be of two kinds, local and general.

The local treatment of consumption is by the inhalation of vapors and powders into the lungs. It has been practised, more or less, by individuals, for many years, particularly in Europe ; but for some unaccountable reason, the profession generally have never used it, and do not know much about it. I had the honor, some years ago to bring it freshly before the American public, in some articles written for popular reading, since which time it has been rapidly gaining public confidence, and is now attracting much attention. Conveying the remedy directly to the diseased parts, it strikes the common-sense mind as eminently reasonable and necessary.

I shall speak of inhalation, therefore, very earnestly, not as a palliative of consumption only, but as far more, as a remedy. After long and patient use, my experience allows me to say, that I know it, in many cases, to be such ; and knowing this, I should be criminal not to press it upon the public ; for it is the great multitude of sufferers, pressing fast through the gate of death, who need to hear words of hope.

**Consumption a General Disease.** — It is not denied that consumption is a general disease, needing constitutional treatment ; but it has also a local development in the lungs, first in the form of albuminous tumors, called tubercles, and then, after the softening,

breaking down, and discharge of these, in the more formidable shape of ulcerous cavities, which, beginning at the summit, devour the lungs down to the base. Can it be reasonable to apply no remedy directly to this local disease? Not so does our profession deal with other local diseases. To an inflamed skin we apply poultices, cold compresses, solutions of acetate of lead, nitrate of silver, etc.; to leprous or scaly affections, sulphuret of potash, bichloride of mercury, zinc ointment, nitrate of mercury ointment, sulphur, creosote, etc.; to weak and inflamed eyes, sulphate of copper, sulphate of zinc, nitrate of silver, and opium; to chronic ulcers upon the skin, tannin, pulverized rhubarb, opium, or cinchona; and to an inflamed throat, nitrate of silver and other articles. These are but specimens of the thousand cases in which we use local remedies. Why, then, when the mucous membrane, which lines the air tubes, becomes inflamed through all its branches, should we neglect, by the inhalation of medicated vapor, to apply a remedy directly upon the whole inflamed surface? Why, when tubercular matter is beginning to be deposited upon the surface of the air cells, and of the small bronchial tubes, should not the vapor go right to those parts, and cause, as it would, the immediate expulsion of this offending and dangerous matter?

Uneducated common sense sees the reasonableness of these suggestions at a glance. Many a person, with pulmonary disease, dies of suffocation, not because there is not muscular strength to expel the matter which is strangling him, but because the lungs *below* the large pellets of mucus, which plug up the bronchial tubes, cannot be inflated, and have therefore no means of driving out the offending substance. Yet a proper medicated vapor, drawn in with the breath, would either dissolve the mucus, or rouse up the expiring membrane to cast it off.

If the reader were to place one end of a stethoscope directly over the disease upon the breast of a person in the third stage of consumption, and should then ask him to talk, the words spoken would seem to rise up through the instrument, and enter, well articulated, into his ear. This, in technical language, is called *pectoriloquy*,—a word signifying *chest-talking*. It implies a *cavity* in the lung. If now the patient be asked to *cough*, a gurgling and splashing sound will be heard. This denotes that the cavity is partly filled with fluid, which is dashed about by the air explosively driven through it by the portion of lung below. Here we have an excavated ulcer, with all its filthy contents, composed of pus, mucus, serum, and dissolved tubercles, lying in it day and night to aggravate its unhealthy condition. What more reasonable, what more necessary, than that a soothing, alterative, or astringent vapor should be drawn into this cavity, to cause its sides to heal, and its absorbents to remove this fluid? A surgeon who should permit an ulcer upon the surface of the body to remain in that condition without a local dressing would be deemed unfit to practise his profession.



Both in tubercular disease and in simple bronchitis, the bronchial tubes almost always suffer some physical change. The mucous membrane lining these tubes is generally softened. At other times the tubes become enlarged through their whole length, so that many of them, from the size of a quill, reach the bigness of the finger of a glove. In still other cases, the straining produced by coughing causes a tube to belly out at some point, forming a sack, which is generally filled with mucus or purulent matter. At still other times, a tubercle will press against a tube so as to flatten it and convert it into a musical instrument, the air, as it is drawn laboriously through, producing a high or low note, according to the size of the pipe. These physical changes are all produced by causes which the inhalation of a suitable vapor, at the proper time, would almost infallibly remove. How strange that this remedy, — so simple, so effectual, so easily comprehended, — should have been so little used!

Right at this vital point in the lungs, where the blood runs in a ceaseless current, — where the whole of it goes *every two minutes* to renew its vitality by contact with atmospheric air, — we have, in thousands of cases daily occurring, inflammation with roughening or softening of membrane, with its consequent harsh breathing; we have mucus, tough or glairy, to impede and interrupt respiration; we have tubercles in the hard or soft state, adding to the general embarrassment, and not only lessening the vitality of the blood, but disturbing all the sympathies of the system; — and yet the practice has been, and is, to attack these central disturbers of life only through the circuitous path of the stomach, lacteals, etc.

I have investigated faithfully the effects of the various substances proposed for inhalation by European physicians, and have explored a wide field of new remedies, not before used, several of which have proved to have qualities of great remedial power.

The chief remedies I employ for inhalation are the following.

**Alterative Inhalant**, composed of iodine, six grains; iodide of potassium, twelve grains; tincture of ipecac, one ounce; tincture of balsam of tolu, six drams; ethereal tincture of conium, one and a half drams; alcohol, half a pint. These are to be mixed. The dose is one to two teaspoonfuls, to be inhaled ten or fifteen minutes, in about a gill of hot water.

The ethereal tincture of conium is made by keeping a dram of powdered conium in one ounce of sulphuric ether a week.

The above inhalant is used in the tubercular forms of consumption, particularly that of the scrofulous kind, and in many cases of bronchitis.

**Expectorant Inhalant.** — Take pleurisy root, half an ounce; squill, one ounce; ipecac, two drams; black cohosh, two ounces; queen's root, one ounce and a half; American hellebore, two drams; diluted alcohol, one pint. Grind the roots, etc., and add the alcohol.

Let the whole stand one week, shaking or stirring daily. Draw off and filter through paper. Two teaspoonfuls make a dose, to be inhaled same as preceding.

This is to be used when the cough is hard and dry, and the expectoration difficult. It makes the raising easy, lessening the soreness of the chest, and the harshness of the cough.

**Soothing, Febrifuge Inhalant.** — Take belladonna leaves, half an ounce; black cohosh, two ounces; American hellebore, half an ounce; poke-root, two drams; aconite root, one ounce; diluted alcohol, one pint. Grind the roots, etc., add the alcohol. Let the whole stand one week, stirring daily. Pour off and filter through paper. Dose, one to two teaspoonfuls, to be inhaled as the preceding.

This is excellent in all cases where the skin is hot, the pulse quick, the tongue and mouth parched, the chest sore, and the system suffering during the whole or a part of each day, from a general feverish condition. It is proper in all the forms of chest disease.

**Astringent Inhalant.** — Take of wild indigo, one ounce; catechu, half an ounce; Peruvian bark, one ounce; golden seal, one ounce; diluted alcohol, one pint. Mix, and let the whole stand one week, stirring daily. Drain off, and filter through paper. Add two drams of creosote. One to two teaspoonfuls to be inhaled as preceding.

This is to be used when the expectoration is profuse and easy, unattended by fever, either in the latter stages of chronic bronchitis, when the mucous membrane of the tubes is in a relaxed condition, or, in the third stage of tubercular disease, for the purpose of constringing, cleansing, strengthening, and healing.

**Antiseptic Inhalant.** — Take wild indigo, one ounce; belladonna leaves, half an ounce; diluted alcohol, one pint. Mix, and let the whole stand one week. Pour off, and filter through paper. Then add solution of chloride of soda two ounces. Dose, one to two teaspoonfuls, to be inhaled as the preceding.

This is used in cases of gangrene of the lungs, generally distinguished by considerable expectoration having a very fetid smell.

**Anti-Hemorrhagic Inhalant.** — Take witch-hazel bark, two ounces; black cohosh, four ounces. Grind, and add one pint of diluted alcohol. Let the mixture stand one week, stirring daily. Pour off, and filter through paper. Add to this two drams of creosote. Dose, one to three teaspoonfuls, to be inhaled as preceding.

This is an excellent remedy for bleeding from the lungs. When there is a tendency to bleed, it should be used for a long time. It may frequently take the place of the above astringent inhalant.

For immediate relief give strong solution of salt water.

**Object of Inhalants.** — Being vaporized and inhaled, these articles enter every air-cell throughout the lungs. Their object is to soothe and mollify inflamed mucous surfaces, to reduce enlarged bronchial



glands which press upon neighboring parts and cause bleeding, to stimulate the absorbents to take up and remove tubercles, to dissolve tubercles out of the pulmonary tissue, to cause ulcerous cavities to expel their mattery contents, and to stimulate their sides to take on a healing process. They should be used from three to six times a day, the inhalation continuing from ten to fifteen minutes.

**Other Inhalants.** — Great numbers of other articles have been used, which I have not space to describe. I will mention, however, that the following are sometimes employed with advantage: —

For an Expectorant Inhalant, take alcohol, four ounces; tincture of camphor, half an ounce; tincture of tolu, two drams; naphtha, one dram; benzoic acid, thirty grains; oil of bitter almonds, four drops. Mix.

For an Anodyne Inhalant, take alcohol, four ounces; naphtha, one dram; benzoic acid, thirty grains; chloroform, twenty-five drops; tincture of henbane, half an ounce. Mix.

For an Astringent Inhalant, take alcohol, four ounces; naphtha, one dram; benzoic acid, thirty grains; chloroform, one dram; tannin, eight grains. Mix.

**Mode of Inhaling.** — For inhaling these, a sponge is fitted into a glass cup, to which a flexible tube is attached. A small quantity of the mixture is poured upon the sponge, and the vapor arising is drawn into the lungs through the tube.

To the expectorant inhalant may be added, occasionally, half a dram of nitric acid.

These latter formulas are the principal ones used by those who practice what is called *cold inhalation*.

A very common mode of inhaling volatile remedies is by saturating a little cotton, contained in a wire basket, with the desired oil or fluid, and placing it over the mouth and nose. It is to be worn throughout the day. Oil of peppermint, creosote, menthol, oil of eucalyptus, etc., etc., are among the more common remedies thus used.

A good inhaler can be bought of any dealer in surgical instruments.

**Constitutional Treatment.** — The rapid breathing in consumption creates too much oxydation of the blood, — so much, that the muscles, especially the heart, are usually *of a bright red*. To prevent the patient from being literally burned up by oxygen, the blood must be de-oxydated as fast as possible.

While there is too much of oxygen, there is, at the same time, a deficiency of carbon. Hence the cold hands and feet, and the general inability to bear frosty weather. The little nutritive arteries, in these thin-blooded persons, stand shivering and torpid with cold, unable to perform their allotted function of nutrition. There is not fire enough, and fuel must be had in the form of carbon. Hence one of the advantages of *cod-liver oil*. This oil, too, as carbon, devours

the oxygen of the blood, and prevents *its* destroying the patient. This idea also explains the fact mentioned by Bennet and others, that in their post-mortems they found the evidences of healed ulcers in numerous persons who had been *spirit-drinkers* while living. And Liebig helps the explanation by saying that alcohol, taken into the system, circulates in a free state in the blood, and devours its oxygen. To which I beg to add, that the *malaria* of intermittent and bilious fever districts, has been pretty satisfactorily proved to be an instable organic body, consisting of sulphur, carbon, and hydrogen, all of which have an affinity for oxygen, and devour it in the system. Consumption is not found in such districts.

As I am here treating of the chemical effects of remedies (and to this test most remedies must finally come), I will mention that tartrate of antimony and potassa *arrests the circulation in the pulmonary arteries*, — which fact gives a complete and luminous view of its power to prevent oxidation. But I am obliged to detract from its merits, by stating that it *also* retards the circulation in the capillaries of the system generally, and so hinders *de*-oxidation.

**Phosphorus.** — There is an article which has more recently presented itself to the notice of the profession, to which I wish to invite special attention. I refer to phosphorus. This agent, for a time, challenged our notice in the shape of *phosphate of lime*; but we could never feel sure that this article was dissolved in the fluids of the body. We now use, and with far more marked effect, the hypophosphites of lime, soda, potash, and iron. These are used in the form of the syrup of the hypophosphites. The dose is a teaspoonful before each meal. The effect upon tubercular disease is immediate and gratifying.

**Need of Phosphorus.** — Cerebric acid contains nitrogen and phosphorus, and is the peculiar component of the brain and nervous system. By combustion and the changes of oxidation in the brain, the phosphorus of cerebric acid is converted into phosphoric acid; so that every act of the brain produces phosphoric acid. How rapid, then, must be the consumption of the phosphoric element of the cerebric acid, in that highly active and excitable state of the nervous system which I have described as peculiar to consumption. And how necessary, in order to save the brain from destruction, to meet this increased demand for phosphorus, by introducing it into the system.

Mulder regards the fibrin of the blood as the *carrier of oxygen*; and by this oxidation, the fibrin becomes converted into the binoxide and trioxide of protein, — its phosphorus and sulphur (for it contains both) being converted into phosphoric and sulphuric acids. Adding phosphorus and sulphur, therefore, as medicinal agents, would seem to be the proper way to supply the fibrin with materials destructive of its freight of oxygen.

It is well known that the salts of phosphoric acid are essential for



the formation of azotic compounds, — compounds which are necessary to sustain animal life. It should be remembered, too, as collaterally illustrating this fact, that the tribasic phosphates of potash, soda, lime, and magnesia, play an important part in the growth and perfection of plants. They are always found in the seeds of the cerealia, and no mature grains are produced where phosphates are absent from the soil. For the production of abundant grain-crops, it is necessary that these salts should exist in the soil, or be applied to it in manures.

It is known, moreover, that in all chronic diseases distinguished by wasting of the tissues, a much larger quantity of phosphates is excreted by the kidneys than in the normal state. Hence there is no healthful growth; and the human organism, like the soil, exhausted of its phosphates by successive croppings, brings nothing to perfection, and needs to have its drained salts re-supplied.

I cannot but call attention here to the inorganic substances found in healthy human blood. According to very careful analyses, by Schmidt:

1000 parts of blood-corpuscles, contain:	1000 parts of liquor sanguinis (serum and fibrin), contain:
Chlorine . . . . . 1.686	Chlorine . . . . . 3.664
Sulphuric Acid . . . . . 0.066	Sulhuric Acid . . . . . 0.115
Phosphoric Acid . . . . . 1.134	Phosphoric Acid . . . . . 0.191
Potassium . . . . . 3.328	Potassium . . . . . 0.323
Sodium . . . . . 1.052	Sodium . . . . . 3.341
Oxygen . . . . . 0.667	Oxygen . . . . . 0.403
Phosphate of Lime . . . . . 0.114	Phosphate of Lime . . . . . 0.311
Phosphate of Magnesia . . . . . 0.073	Phosphate of Magnesia . . . . . 0.222

Iron is omitted. Now, I venture the prediction, that out of these figures, mainly, in connection with those which represent the constituents of the saliva, the bile, the gastric juice, the pancreatic secretion, and the organic compounds of the blood and tissues, are to be evolved within a few years a correct and partially demonstrative system of medication. In consumption, all the inorganic bodies represented by the above figures, with the exception of oxygen, are deficient in quantity. By reflecting upon the proportions of these several bodies, particularly upon the large amount of chlorine and soda in the plasma, and of potassium in the corpuscles, the mind can hardly fail to obtain useful hints. I have not hesitated to make one of these hints the ground of a very free use of alkalies, — particularly in the form of bathing.

**Sugar of Milk.** — There is one other medicinal article which I deem worthy to be made prominent, and to be placed side by side with cod liver oil and the hypo-phosphites. I refer to *sugar of milk*. It belongs to that class of non-nitrogenized articles which Liebig has denominated supporters of respiration. Its great affinity for oxygen is well worthy to be taken into the account, in considering its value in consumption. So great is this attraction, that, with ammonia and other alkalies, it has the power of reducing some of the metallic oxides.

When taken into the stomach, it is rapidly absorbed into the blood, which, being an alkaline fluid, augments its great de-oxidating power to a considerable degree. It unites rapidly with oxygen after entering the blood, forming carbonic acid and water. A part of it, however, does not enter the blood in an uncompounded state, but is changed in the stomach into lactic acid; and this, in the blood, becomes an alkaline lactate. But the portion thus changed appears also very useful; for Lehmann says: "We know of no substance which could better act in the blood as food for the respiration, than the alkaline lactates."

Corroborative of these views is the fact that all those kinds of milk, such as goat's, ass's, etc., which contain the largest amount of sugar of milk, have at different times, and in various countries, obtained a reputation for curing consumption. Goat's whey, in which this article abounds, and from which it is largely manufactured, has been celebrated for its virtues in this line. Ancel speaks of it as an excellent remedy; and Pereira says, "Sugar of milk, in consumptive cases and chronic diseases of the digestive organs, is a most valuable aliment."

One of the best forms of taking sugar of milk is that of a gruel, which is quite palatable, and may be freely eaten by consumptive persons.

**Creosote, Guaicol, etc.** — Modern researches having proved that consumption, as well as many throat and other diseases are propagated by germs or *bacilli*, as explained on page 269, medical investigators have for a long time been seeking some agent that would destroy these germs without at the same time injuriously affecting the human system. A few years ago Dr. Robert Koch, a celebrated German scientist, who had long been investigating the consumption, cholera, and other microbes, thought he had discovered a lymph that would destroy or at least counteract the consumption bacillus; but unfortunately it proved a failure. Creosote, carbolic acid, guaicol and similar drugs kill the germ when outside the body, and for this reason most therapeutists of to-day use these remedies in as large a quantity, and for as long a time as the system will tolerate. At all events, whatever may be the outcome of the custom at present in vogue, creosote certainly arrests the rapid proliferation of germ-life in the lungs, improves the appetite and digestion, lowers the temperature, and apparently helps the patient. The only offset to the use of this class of remedies lies in the fact that one cannot thoroughly disinfect the blood sufficiently to kill these germs completely. Creosote made from beechwood, taken in three-drop doses with a wine-glass of milk, after food, three times a day, is the usual form of administration. This dose should gradually be increased till ten and even twenty drops are taken at a time. The carbonate of creosote is a more elegant and perhaps more effective form of the drug. This medicine may also be procured in the form of capsules and pills.



By Dr. Cyrus Edison's recently discovered product of carbolie acid, asepsin, it is claimed that seventy per cent of consumptive cases can be cured. It can only be administered as a hypodermic injection, however, at the hands of an experienced practitioner.

**The Cough.** — The best article I have ever used for this is the "Pulmonic Cherry Cordial." I was five years in compounding this article to suit me, and I believe it to be the very best cough preparation ever made. Dose, from one to two teaspoonfuls.

**Pulmonic Cherry Cordial.** — Wild-cherry bark, ground, 10 pounds ipecac root, 20 ounces; bloodroot, 24 ounces; squill root, bruised, 12 ounces; pulverized liquorice root, 5 ounces; cochineal, bruised, 2 ounces; anise seed, 32 ounces; fennel seed, 8 ounces; orange peel, 16 ounces; acetate of morphine, 12 drams; alcohol, 8 gallons; water, 8 gallons; pulverized white sugar, 40 pounds; sulphuric acid, 1 ounce.

*Directions for making.* — Grind all the articles to a coarse powder except those directed to be bruised or pulverized, and put them *all* to the alcohol *except* the wild-cherry bark, the water, the sugar, and the sulphuric acid. Let them stand one week, shaking or stirring thoroughly twice a day. Then, having kept the wild-cherry bark two days in a covered vessel, with water enough upon it to wet it through, place it in a percolator, and run eight gallons of water through it. Add this to the alcohol and other ingredients. Let the whole stand three days longer, stirring as before, twice a day. Draw off, and filter through paper. Now add the sugar, and lastly the sulphuric acid. The acid is intended mainly to improve the color, by acting chemically upon the cochineal. The color is a fine cherry red, tinged with orange.

I have given the directions for making sixteen gallons — this being the smallest quantity in which I make it. Any person can easily make the calculation for reducing the quantity. The assertion previously made that this is the "best cough preparation ever made," I see no cause to modify in the smallest degree. Were it kept in every apothecary shop, and were physicians to prescribe in pulmonary complaints, adding a little syrup of squills or wine of ipecac when a more expectorant effect is wanted, or a little morphine if greater narcotism is sought, it would save them much trouble in compounding cough syrups, and give them much more satisfactory results. I have compared its effect, again and again, with the best other preparations in use, and I pledge my word that it will succeed in twice as many cases as any other compound that may be chosen. Let physicians try it; and I will be responsible for ever hair's breadth in which they find this proportion of successful results abridged.

When a more quieting effect is needed, a little morphine may be added to this preparation; if a more expectorant influence is required, add a few drops of the tincture of *veratrum viride*. For the great

majority of cases, it will be found to be right without any addition. When this is not at hand, any of the preparations (108), (112), (109), (113), (110), etc., may be used. Another good preparation is Dr. King's consumption cure.

**Night Sweats.**—The very best preparation for these sweats is a compound of the oxide of zinc, one dram; extract of conium, half a dram; to be made into twenty pills, of which one or two are to be taken every night. The sponge bath also does much to check these sweats, and vinegar baths (369). Atropia,  $\frac{1}{100}$  of a grain on retiring, and especially Agaricin,  $\frac{1}{6}$  grain, will cause the sweats to stop absolutely.

**Diarrhœa.**—This is a most exhausting symptom in the latter stages of consumption. The only remedy which has much effect in controlling it is the *tris-nitrate of bismuth*. This should be given in doses of thirty grains immediately after, or at the time of each meal. These doses are much larger than used to be given; but they will do no harm. Given to this extent, I find the bismuth very effectual.

**Iron.**—This preparation, in some of its forms (316), (73), (159), (102), is almost always needed in consumption. If the scrofulous habit be strongly marked, give syrup of iodide of iron, in thirty-drop doses, three times a day. It should be taken in a glass of water. To the feeble administer Gude's pepto-mangan in teaspoonful doses three or four times daily. This is one of the simplest and most efficacious forms of iron we have.

**External Irritants.**—These are needed where there is much inflammation and soreness of the chest. Blisters should very seldom be used. Croton oil, from two to half a dozen drops, rubbed over the sore part, generally answers very well. Sometimes the mustard paste, applied to the extent of producing redness, two or three times a week, is sufficient. Nitric acid, reduced with water to a strength a little above the strongest vinegar, answers a good purpose for keeping up an irritation.

**Atmospheric Inhalation.**—It has been said by Laennec and others, that asthma has sometimes the effect of arresting tubercular consumption. Dr. Ramadge thought this was effected by an expansion of the vesicular structure of the lungs; and he reasoned that the same expansion, by mechanical means, would secure a similar end. To effect this, he made his patients take long breaths through a tube constructed for the purpose.

It is manifest that the philosophy of atmospheric inhalation was not understood by Dr. Ramadge, nor has it been by any of his followers in this country.

Rokitansky thinks the tubercular habit depends upon the excess of fibrin in the blood; and says that the reason of consumption being arrested by pregnancy is, that this condition offers a mechanical ob-



stacle to the transmission of blood through the lungs,—thus preventing its excessive oxidation, and keeping it in a venous state. This destroys the fibrinous condition, on which he thinks tuberculosis depends.

Now this is precisely what is done by atmospheric inhalation. The trachea divides, on its entrance into the lungs, into two branches, which again divide and subdivide until the tubes become smaller than can be seen, each terminating in a minute air-cell. Over this entire surface the air is intended to be brought into communication with the blood for the purpose of oxidating it. By forcible inhalation, the air-vesicles are inflated to the extent of their capacity, by which means the extreme branches of the pulmonary arteries are so flattened between these extended cells, as to be able to convey but a small amount of blood, and but little is oxidated. This furnishes a mechanical obstruction to the transmission of the blood, and secures the defibrination of which Rokitansky speaks.

This is my view of the philosophy of atmospheric inhalation. The benefit results, not from a larger amount of oxidation, as is generally supposed, but from a smaller. Asthma does the same thing by producing spasmodic contraction of the extreme bronchial tubes, and preventing air from entering the cells.

The same end is gained in part by certain kinds of employment, as glass-blowing, playing upon wind instruments, and the like. Writers of distinction mention cases of recovery from incipient consumption by a vigorous use of the lungs in singing. Dentists subject their lungs to a similar process of expansion in the use of the blow-pipe; the writer has known several instances in that profession, in which recoveries have taken place.

**The Conclusion** to which I come is, that atmospheric inhalation may be used with great advantage in some cases, but should never be resorted to except under the direction of a competent physician. In a congested state of the lungs, with hæmorrhagic tendencies, or with inflammation and soreness, it is well fitted to produce fatal bleeding and is of course dangerous.

**External Use of Water.**—As a relaxation from severe exertions, the ancients had frequent recourse to bathing. Those who contended in the race, throwing the javelin, and wrestling, at Rome, plunged into the Tiber while warm and panting with their efforts. That this promoted prowess and physical endurance, none can doubt.

Louis, the great French authority on pulmonary diseases, lays down several rules to be observed by consumptive patients, and particularly mentions cold bathing.

Few things give tone to the capillaries of the skin like cold water, systematically applied. It rallies the powers of the constitution, and improves assimilation. And by it another object is gained of scarcely less importance. — that of guarding the system against taking cold.

Those in the daily habit of applying cold water to the whole person seldom suffer from colds and catarrhs; they generally become hardened so as to endure the assaults of the elements.

Consumptive persons should generally use the *sponge* bath, with cold water, if it can be endured, otherwise the tepid bath, to be followed, in all cases with brisk rubbing, with a coarse towel. If a sense of chilliness and discomfort follows the bath, a large portion of the water must be squeezed from the sponge, so as to use but very little, and the washing must be speedy, and the rubbing more lively than usual, — beginning with tepid water, and gradually lowering the temperature till it can be borne cold. A large teaspoonful of saleratus to each quart of water should be used.

### Diet.

THE diet, like all other parts of the treatment, must have reference to the *present condition* of the patient. If the disease take the bronchial form, and rapid breathing, and other conditions calculated to carry fat out of the system have not yet supervened; or if the patient have thirst and hectic, the diet must be spare and simple, — consisting chiefly of milk and farinaceous substances.

But in all cases where the disease is tubercular, or, being bronchial, has reached the stage of emaciation, the very earliest moment at which the fever can be subdued should be improved to build up the patient with a generous diet. I have seen cases where the stuffing sometimes resorted to for fattening turkeys for Thanksgiving would seem to be almost justifiable. A good rule is to give the most generous diet that can be taken without disturbing the stomach, or increasing the feverish symptoms. Animal food with a good quantity of salt should be freely taken. Fat meats, if well received by the stomach (and they generally are if taken *cold*), are particularly useful. The same is true of sweet butter and cream.

**Out-Door Exercise.**— Without exercise, as a general thing, the consumptive patient will die. Exercise involves muscular exertion, which is attended by the tension, compression, and greater compactness of the muscles used. Extend your walk a little every day. Stretch it out to the distant fields. Gather flowers from the top of the hills and from the bosom of the valleys, and bring them home as trophies of your victory.

If not able to begin with walking, ride as often as possible in a carriage. The jolting of a vehicle will jog the blood along much better than no exercise.

Horseback riding is still better. It combines, in some measure, the passive exercise of carriage riding, with the active exertion of walking on foot.

If the person who has only a small portion of the lung affected and whose general health and strength has not failed, the employment



of this advice for exercise cannot be too strongly put forth, as it means the continual inhalation of pure air, caused by the exercise, but I would not have a patient who has perhaps been greatly affected by the disease, think that the way is not open to him for improvement. He will of course not be able to exercise so strenuously, in fact, perhaps the majority of cases do not require as much exercise as has been advocated, provided however, they are placed *in a position where an abundance* of fresh air is also available and no symptoms appear which show that the strength is being called upon too vigorously, such as the patient being unable to sleep at night and digestive disturbances occur. But to the cases more advanced in the disease, it should be remembered that exercise will do more harm than good and the whole question will be an individual one as no general rules can be laid down for the patient. For as many hours and days as is possible, the patient should be exposed to the direct rays of the sun and protected from high winds. This may be attained on a high elevation, such as the roof of the house, with a southerly exposure.

If it is so the patient can travel, some high, dry climate about 4000 feet in elevation is the best place, and in selecting this resort the thing to be considered is the number of hours of the sunshine he or she will be able to be subjected to. We do not consider now the degrees of temperature, if the climate is free from moisture, as the patient can be properly clothed and be allowed to remain out of doors all day. The high altitude recommended is also beneficial because the patient is obliged to take deep breaths, thus being obliged to exercise his lungs.

Colorado and certain parts of Arizona and New Mexico in the United States, portions of Switzerland which have an elevation of four to five thousand feet above sea level, and San Moritz, abroad, are examples of suitable places.

Before leaving the subject, and for the encouragement of those affected, from the latest statistics at command, sixty per cent. of early cases have been discharged well from the Adirondacks Cottage Sanatorium.

Trudeau, the eminent authority of the United States, reports that one-third of all the cases under his observation during the past seventeen years are well and that two-thirds of the earlier cases are cured at the present time. Thirty years ago physicians thought that only two per cent. of the cases were curable.

Sea voyages are now not recommended, with the dampness naturally attending the trip, the lack of comfort on the steamer, the short length of time consumed by the trip, its compulsory confinement and the inability to eat nourishing food, if seasickness is present, all weigh against this treatment; in fact, from what has been said, if common sense is used a great improvement can be expected at, or within a reasonable distance of, the patient's home.

Numerous other modes of exercise may be resorted to with advantage. Dumb-bells, adapted in size to the strength of the patient, and used with caution, are highly serviceable. The battledoor, the football, bicycle riding, pitching quoits, and the athletic sports of the gymnasium, all have their appropriate place. The greater the variety the better, as by it all parts of the system are brought into play, and both the mind and the muscles get the change which they need.

It is hard to impress patients with the importance of this subject. Say what you will, they somehow or other get the idea that a moderate amount of exercise, taken when they feel like it, is all that is required. Fatal mistake! Whatever the physician may do, the patient has a great deal to do for himself. He must strive to develop his physical powers to the utmost. He must train himself as runners and fighters do when preparing for their surprising feats; for he is running against the swiftest disease (or the surest winner) of our climate, and fighting with the elements.

If he regards life as not worth this exertion, of course he will not make it; but I beg him to consider that without it recovery will be uncertain, and in many cases, impossible. Do as I have directed, and if your medical attendant is skilful, the current of health will, in many cases, begin to flow back to you. Life will renew to you its policy of insurance, and multiply your days.

**Drugs.**—Tonics and bitters to help the appetite, iron, strychnine, quinine in very small doses as a tonic; of the heart supporters digitalis may be given when indicated and used carefully under the advice of a physician, cough sedatives of which, perhaps, the most useful is one which may now be obtained at all drug stores, is the Elixir of Terpin hydrate with heroin in the dose of a teaspoonful four or five times a day.

**Travelling:**—Consumptive patients have generally been sent to a southern climate. But where the case involves dyspepsia and affections of the liver, low latitudes are generally unfriendly. Liver complaints are the bane of a southern climate, and a sallow complexion is the inheritance of a southerner.

*Tubercular* persons, chilled by our northern climate, are sometimes temporarily relieved by the warmer atmosphere of the south. But the relief is only temporary; for, having lost the power, as they imagine, to bear the frowns of our northern sky, they are dying, and will die anywhere unless they recover this power. And the way to retrieve a lost advantage over an enemy, is, not to retreat to a point where recovery will be harder, but to meet him at once. If the constitution cannot bear up against an enemy under the bracing of a northern atmosphere, it will be still harder to do so under the wilting of a southern.

After all, the objects aimed at should be *change* and *travelling*. The exercise involved, the **constant** exertion required in getting from



place to place, the agreeable sensations produced by the motion of cars and steamboats, the ever varying change of sights and sounds, and the constantly increasing stock of one's ideas of men and things, — these are what rally the constitution, and open anew the springs of life.

Especially should all journeys for health be taken, if possible, with an object in view. Let the consumptive start with the view of seeing the cave of Kentucky, the prairies of the West, the great lakes of the North, the falls of Niagara, the fortress of Quebec, the Saguenay river, the doctor, who he has reason to think will cure him, — *anything* which he is willing to make exertion to see, and that he is sure his eyes will rejoice in beholding.

I have thus spoken of consumption more at large than of other complaints, because it is the great disease of the world, and is increasing with the advancement of civilization.

### Acute Bronchitis.

THIS is an acute inflammation of the mucous membrane lining the air-tubes in the lungs. It is generally quite a serious disease.

**Physical Signs.** — The sound upon percussion is generally good. If there be any dullness, it is commonly in the lower and back part of the chest. This occurs only in "Capillary Bronchitis."

The breathing murmurs are sometimes more, sometimes less intense than natural. Occasionally they are almost extinct.

In the early stage, sibilous and loud rattles.

In the more advanced stage, mucous rattle.

Now and then sub-crepitant rattle accompanies the inward-drawn breath.

**General Symptoms.** — The disease begins with chills followed by fever; tightness across the chest, difficulty of breathing, hoarseness, loss of strength, costive bowels, and a quick and hard pulse. Water runs from the eyes and nostrils, and there is a dry, harsh, croupy cough.

After a few days, mucus begins to be raised. This expectoration gradually becomes more copious, and is opaque, yellowish, or greenish, and occasionally streaked with blood. This mucus is very ropy and adheres to the vessel.

There is more or less pain in the chest; pain across the forehead, which is increased by coughing; and a pale and anxious countenance.

In severe cases, the tightness across the chest is extreme, with a sense of suffocation, causing the patient to call for the opening of the windows. There is great difficulty of breathing; a paleness and lividity of the cheeks and lips; a loud wheezing and rattling in the throat, followed by cold sweat, insensibility and death.

In children the disease comes on like a common cold, attended by

a sore throat, a great desire to drink, but a disinclination to take food. But two or three swallows of drink can be taken at a time for want of breath. The phlegm is frequently vomited up spontaneously.

**Observations.** — The loud and sibilous rattles are produced by similar causes, namely, the passage of air along tubes whose interior is dry and rough from inflammation, or whose calibre is contracted or altered in form by the swelling of the membrane, effusion upon its inner surface of a tough, mucous substance, or a pressure upon its external surface of tubercles, swollen glands, aneurismal tumors, etc. The two sounds differ mainly in the key upon which they are pitched, — the sonorous, or low-keyed, coming from the larger tubes; the sibilous, or high-keyed, from the smaller, — just as the low notes of an organ come from the large pipes, and the high notes from the small ones.

**Causes.** — It is generally brought on by a sudden cold, by changes of the weather, and by inhaling irritating substances. It is a secondary result, too, of scarlet fever, measles, small-pox, whooping cough, and the remittent fever of infants.

**Treatment.** — In mild cases, give warm balm or flax-seed tea, hot lemonade, or other similar drinks, — at the same time soaking the feet in hot water, and, on retiring to bed, apply bottles of hot water to the feet and sides, to produce sweating. If the bowels be costive, some gentle physic, as rhubarb and magnesia, or salts and senna, may be taken.

Chloride of ammonia in teaspoonful doses diluted in water and citrate of potassium in 10 to 20 grain doses, or better still, a mixture of

Chloride of ammonia,	3 drachms or teaspoonfuls.
Citrate of potassium,	4       “       “
Compound licorice mixture,	3 ounces.

Shake the bottle.

Take of the above, one teaspoonful diluted with water every three hours.

In the case of infants, an emetic of wine of ipecac, or compound tincture of lobelia, should be given, and followed with slippery elm and flax-seed tea. The compound tincture of lobelia, with tincture of veratrum viride, may be continued for a time as an expectorant.

In more severe cases, both of adults and children, an active emetic is required, — perhaps the compound powder of lobelia is as good as any. This must be followed with tincture of veratrum viride, in full doses, so as to reduce the pulse at once, and keep it down to the natural standard. This is one of the very best articles in this complaint, and will generally very much lessen its violence and duration.

If there is much difficulty of breathing, the air of the room must be kept moist, as recommended in croup.



The room should also be kept warm, — decidedly warmer than in the case of other fevers.

A gentle perspiration should be kept up by small doses of compound tincture of Virginia snake-root, and by frequently bathing the surface, or else by tincture of veratrum.

Mustard should be applied to the chest, and to the soles of the feet.

The cough may be managed by preparations (104), (106), (110), freely given.

The diet should be confined to barley-water, toast-water, apple-water, rice-water, and a solution of gum-arabic.

### Chronic Bronchitis.

THIS is an inflammation of the mucous membrane of the air-tubes, which continues a great length of time, without any sudden or remarkable changes.

**Physical Signs.** — The percussion-sounds are similar to those of acute bronchitis. When a bronchial tube is dilated, we sometimes have dullness around the dilated part.

The breathing murmur is always accompanied by a mucous, sonorous, or sibilant rattle, — sometimes by a subcrepitant.

When dilatation of the tubes exists, the intensity and duration of the sound of the ingoing breath is *decreased*, — of the outgoing *increased*.

In this state of the tubes, we also have cavernous breathing, bronchophony, sometimes pectoriloquy, and bronchial or cavernous cough.

**General Symptoms.** — A cough is generally present, which is increased in wet weather, and by every slight cold. This comes on in paroxysms; is generally worse in the morning; and is relieved by raising freely. The matter raised is generally yellowish, but sometimes whitish and sticky; and in the latter stages is thick, and sometimes very much like that of consumption. Indeed, the disease often ends in bronchial consumption.

**Remarks.** — The breathing is bronchial or cavernous when the dilated portion of the tube is empty; if it contain fluid, the mucous rattle will be heard.

Dullness on percussion will exist if a dilated tube press upon the surrounding portion of lung so as to condense or make it solid.

Dilatation of the tubes occurs only in chronic bronchitis of long standing. Its physical signs are much like those of a cavity in advanced consumption. The examiner may learn to distinguish them by considering that in consumption, *dullness precedes the cavity*, while in bronchial dilatations, the *cavity precedes dullness*.

The dilatation or swelling out at some point of a bronchial tube is caused by obstructions to the passage of air through it, — just as

an India-rubber tube, partially closed up at a given point, will bulge out just in front of the obstructed place, when air is forcibly blown through it, and just as the left ventricle of the heart enlarges when the blood is obstructed in its passage through the aortic valve.

**Causes.** — It often occurs as the result of acute bronchitis, and also of measles, whooping-cough, etc. But taking cold, and damp and changeable weather, are more frequently its causes. It most often follows chronic inflammations of the throat, which, being neglected, gradually creep down the windpipe into the tubes, and become very obstinate in their character.

**Treatment.** — Medicinal inhalation is one of the best remedies for this complaint. The inhaling powder has, in many cases, great efficiency. The dose is about what can lie on a ten-cent piece. It should be used once a day, in an instrument represented in the cut.

This instrument I had constructed for my use. It consists mainly of a glass tube and a receiver, — the latter being something like a tube-vial, pierced with fine holes around the lower end. The powder is poured into the receiver, which is placed in the larger tube,



FIG. 94.

and twirled between the thumb and finger while inhaling.

When the powder cannot be easily got down into the tubes in the lungs, — as often happens, — the inhalation of medicated vapor will do better. If the expectoration be difficult, the expectorant inhalant, described under “consumption,” should be used; if the expectoration be too profuse and free, the astringent inhalant must be taken.

The cough preparations recommended for consumption, also (113), (112), will be the proper ones in this complaint.

The daily alkaline bath, and brisk friction, are particularly serviceable.

Out-door exercise is almost as necessary in this disease as in consumption.

### Enlargement of the Air-Cells. — *Emphysema.*

THIS disease consists in enlargement of the air-cells, the obliteration of their vessels, and the wasting of their walls.

**Physical Signs.** — Thumping upon the chest gives a clearer and louder sound than natural, — one which is tympanitic, or drum-head like.

The murmur of the ingoing breath is *diminished* both in duration and intensity, — of the outgoing breath, it is *increased*.

Dry, crepitant rattle attends the ingoing breath only; occasionally, sibilous rattle.



**General Symptoms.** — Habitual shortness of breath, and very great difficulty of breathing, occurring in paroxysms, which cause the patient to rush to the open window for air.

There is generally a cough, and the matter raised is frothy, liquid, and mucous, or watery.

The face has a peculiar dusky color, and the countenance an anxious, melancholy expression. The nostrils are thick, and the lower lip full. The muscles of the neck are large, and the gait of the patient is stooping. The strength is wasted in proportion to the difficulty of breathing.

Emphysema tends to produce disease of the heart, Bright's disease, and venous congestions in the head.

**Observations.** — The tympanitic sound is caused by the increased amount of air in the cells.

The air-cells have lost their elasticity, the air, in a great degree, *remains in them*, — not passing in and out, — hence the absence of the vesicular murmur.

The crepitant rattle attends the ingoing breath only, and is supposed to arise from the expansion of the lungs which are in a drier state than natural. It has been compared to the sound produced by blowing into a dried bladder.

**Treatment.** — To whatever extent the air-cells are destroyed, to that extent, of course, the disease is incurable. It may, however, be palliated and relieved to a great extent.

Generally, bronchitis exists in connection with emphysema; and when this is found to be the case, the remedies for that disease must be employed. (370) often is curative.

The inhalation of tincture of stramonium, in one or two teaspoonful doses, the same as the alterative inhalant is used, will be useful.

To be taken internally, an excellent preparation may be made by uniting one dram of ethereal tincture of lobelia with two drams of tincture of ipecac, and two ounces of ammoniac mixture. The dose is one or two tablespoonfuls. Half-grain to grain doses of extract of *cannabis indica* are excellent to relieve the difficulty of breathing.

The diet must be very carefully regulated, as overindulgence at the table aggravates the symptoms.

Change of air is often highly beneficial; but it is impossible to predict its effect beforehand in each individual case.

### **Swelling of the Lungs.** — *Hypertrophy of the Lungs.*

THIS can hardly be regarded as a disease. It generally takes place in but one lung, and is the result of the inaction of the other. Thus, when one lung is diseased, the other has to do the work of both; and being overworked, it enlarges, as the heart or an arm does when very much exercised.

The only treatment required is to eat sparingly, and exercise with great moderation, so as not to increase the rapidity of the breathing.

### Pulmonary Apoplexy.

THIS is generally the result of a disease of the heart, particularly of the *mitral* valve.

**Physical Signs.** — Percussion yields a clear sound, except where the engorgement of blood is large, and near the surface, — in which case, it is dull.

The sound of breathing is feeble or absent over a limited space.

Bronchial breathing is heard in some places, and bronchophony in part, in the same regions.

Mucous rattle is also heard.

**Observations.** — In this disease the small air-tubes and air-cells are the seat of bleeding; and the blood becoming coagulated here, closes these vessels against the entrance of air. This explains the feebleness or absence of the breathing murmur.

The fluidity of blood in the immediate vicinity gives rise to the mucous rattle.

**General Symptoms.** — These are, difficulty of breathing, tightness, and dull pain in the chest. The mucus raised is tinged or streaked with blood. The blood raised is darkish, and dirty-looking. This last symptom, the dirty look of the blood, is peculiar in this disease.

**Treatment.** — The most important remedy is dry-cupping upon the chest. This will often arrest the disease at once. Counter-irritation by croton-oil is also useful. A free movement of the bowels by a preparation containing croton-oil, or elaterium (31), (33), has an excellent effect.

### Air in the Chest. — *Pneumothorax*.

THIS disease consists in the presence of air in the cavity of the pleura. Generally, there is also water in the pleural sac at the same time; the water, being the heavier fluid, occupying the lower part of the cavity, and the air the upper part.

**Physical Signs.** — Tympanitic or drum-like sound over the upper part of the side. Dull sound over the lower part. Breathing murmur diminished or suppressed. Amphoric breathing. Metallic tinkling.

**General Symptoms.** — Great oppression of the chest, and difficulty of breathing; generally attended by palpitation of the heart, and frequently by severe pain under the breast-bone, on the affected side. The patient generally has to remain in the sitting posture, and cannot lie an instant on the sound side.



If, on percussion, one side of the chest sounds louder than the other and the breathing murmur is heard distinctly on the side which gives only a moderate sound, and is not heard at all on the loud-sounding side, we may be sure it is a case of air in the chest.

**Observations.**—The metallic tinkling is like the sound produced by dropping a pin's head into a metallic dish, or like the distant tinkling of a sheep-bell, or the gentle pulling of the string of a violin.

It is supposed that when the fluid in the cavity of the pleura happens to be higher than the orifice, the air, when it enters at each in-drawn breath, forces its way up through the fluid, in the shape of bubbles, and, bursting at the surface, gives the tinkling sound. This sound is sometimes produced, too, by the falling of drops of liquid from the upper part of the cavity, upon the surface of the fluid.

The amphoric breathing is like the sound produced by blowing obliquely into an empty cask. One writer says he heard the same sound when out shooting on a rough day, produced by the wind blowing sideways into the gun-barrel.

**Treatment.**—I would recommend the use, two or three times a day, of the antiseptic inhalant, mentioned under the head of consumption.

To this should be added dry-cupping over the whole chest, which generally gives great relief. Blisters may also be used.

Sweating must be encouraged in the manner recommended under acute bronchitis.

For the difficulty of breathing, give half-grain doses of cannabis indica, or five-drop doses of tincture of aconite, or one-sixth of a grain doses of svapnia. Extract of belladonna, or of stramonium, is also worthy of trial.

### Water in the Chest.—*Hydrothorax.*

THIS disease consists in a collection of water in the cavity of the pleura.

**Physical Signs.**—There is a dull sound over the effusion.

The breathing murmur is diminished, and gradually disappears altogether over the space occupied by the effusion.

Bronchial breathing is heard in the same part.

When the amount of fluid is small, egophony is heard in the middle regions of the chest.

Bronchophony is heard when the effusion is larger.

**General Symptoms.**—Either upon lying down, or using active bodily exercise, the patient finds his difficulty of breathing *increased*. When in bed, he lies with his head and shoulders raised, which, by causing the fluid to settle at the bottom of the cavity, prevents, in a measure, its pressure upon the lungs, and gives him a little rest.

His sleep is interrupted by sudden starts with alarm and terror. The pulse is hard, the thirst great, the urine scanty and high-colored, and has a sediment. After a time the feet swell, the face is pallid and livid, and the countenance expresses anxiety and alarm. There is a short, dry cough.

When the quantity of fluid in the chest becomes large, the patient cannot lie down at all, and only gets short and disturbed naps in the sitting posture.

Of all the symptoms, the starting in sleep is the most certain sign of the disease.

**Causes.**—In some rare cases, this may occur as a primary disease, — that is, as a disease not dependent upon any other as its cause. The greater number of cases, however, are secondary. They arise from organic disease of the heart, or liver, or stomach. Inflammation of the pleura is a very frequent cause.

A plethoric, or full state of the system, predisposes to this complaint, — particularly in those persons who indulge freely at the table.

It may arise, too, from the striking in of skin eruptions; from the free use of liquors; and from frequent excessive bleedings or purgings.

**Treatment.**—Dry-cupping is a valuable remedy, and should always be practised.

The chest should be painted with the tincture of iodine, and a good degree of substantial soreness be kept up.

The internal remedies are purges (31), (14), (30), and diuretics (128), (129), (130), (131) when the patient is not very weak.

The iodide of potassium, in doses of five or six grains, once in three or four hours, is an excellent remedy. The following is a good form of taking it: iodide of potassium, one ounce; fluid extract of pipsissewa, two ounces; water, half a pint. Dose, one teaspoonful.

The skin should be bathed and rubbed daily, three or four times, with much friction. Tapping the chest should be done when the fluid persists any length of time, otherwise a simple hydrothorax may become a doubly serious empyema or pus in the chest.

### **Pleurisy.**—*Pleuritis.*

PLEURISY, or pleurisy fever, as it is sometimes called, is an inflammation of the pleura, or the membrane which lines the chest, and, at the same time, is folded back so as to cover the outer surface of the lungs.

The pleura, as is elsewhere explained, is a short sac or bag, whose inner sides are kept moist, so that they may slide easily upon each other as they are moved by the alternate contractions and expansions of the lungs in the act of breathing, and whose outer sides are made to grow, — one to the inside of the chest, and the other to the outside of the lungs.



Pleurisy and lung-fever, then, must be kindred diseases, and exist, more or less, together. In truth there is almost always some affection of the pleura in lung-fever, and some affection of the lungs in pleurisy. The pain in lung-fever is owing to some inflammation of the pleura; and the appearance of the rusty-colored phlegm in pleurisy indicates that the lungs have been reached by the inflammation of the membrane which covers them.

**Physical Signs.**— Flatness on percussion, at the lower part of the chest, which ascends as the effusion of water increases.

If the effused fluid is not great, there is puerile breathing at the top of the lung.

Friction sound is heard occasionally in first stage of disease.

Egophony is heard when the amount of fluid in the pleura is small.

As the amount of water increases, bronchophony appears.

**General Symptoms.** — This disease is most frequently introduced by *shiverings*, which are soon succeeded by high fever, with a peculiarly hard, resisting pulse; sharp, *stabbing* pain in the side,—generally just below the nipple, but sometimes extending to the shoulder, arm-pit, and back; hurried and interrupted breathing; and a short, dry cough.

The pain is greatly aggravated by motion, coughing, or an attempt to take a long breath. It holds the patient under constant and powerful restraint. We find him lying upon his back, or his well side; his countenance full of anxiety,—fearing to move, cough, or even breathe needlessly; and often crying out from the keen torture these necessary acts inflict in spite of all his caution.

At a more advanced stage, when the tenderness has somewhat abated, he will prefer to lie on the diseased side, as this leaves the healthy lung more at liberty.

**Observations.** — The first effect of the inflammation of the pleura is to dry up the moisture with which its inner surfaces are lubricated, or made smooth and slippery. As a consequence, these surfaces become rough, and rub harshly upon each other, and produce a sound, in the early stages of pleurisy, like that of rubbing two pieces of wet leather together. It may be imitated by rubbing the finger back and forth upon a table. It is sometimes a creaking noise, like that of new shoes.

As the disease advances an important change takes place in the state of things. Instead of an unnatural dryness, a watery fluid is poured out copiously from the inflamed surfaces of the pleural sac. This is called *the period of effusion*. This generally, though not always, relieves the pain. But, by compressing the lung, causes dangerous difficulty of breathing.

The air-cells are compressed by the effused fluid, and are not penetrated by air. Hence the absence of the breathing murmur.

The pouring out of water between the layers of the pleura, compresses the lung, and removes it from the walls of the chest. Hence the dullness or deadness of sound upon percussion.

When listening with the stethoscope, the voice of the patient sounds feeble and interrupted, like the bleating of a goat, and is hence termed, *egophony*, or *goat-voice*.

This peculiar voice is heard only when the effusion of water has been moderate in quantity, and only a thin layer of liquid lies between the ribs and lung. It is caused by the voice passing over this thin layer, which is thereby thrown into *vibrations*, or wavy, quivering motions. When thus agitated, the fluid reacts upon the voice, making it sharp and tremulous.

When the effusion has become large, these effects cease; but another sign then shows itself, and distinguishes pleurisy from the healthy state, and likewise from the solid, hepatized state of the lung in lung-fever. It may be discovered thus:

If the hand be laid flat upon the chest of a healthy person, while he is speaking, a *vibration* or *thrill* will be left. If, in like manner, the hand be laid upon the chest of a person having lung-fever, with hepatized lung, this thrill will be found still more perceptible. But when the hand is placed over the place of watery effusion on the chest of a person having pleurisy, there will be discovered, when the person speaks, *no thrill whatever*. *The absence of this thrill, then, is one of the very best signs of pleurisy with effusion.*

Persons recover from pleurisy sometimes very rapidly, before effusion has taken place. It is then said they have had an attack of *dry* pleurisy. When liquid has been poured out, even in considerable quantity, it is sometimes reabsorbed, and the patient recovers perfectly. In other instances, it compresses the lungs, interferes seriously with breathing, reduces his strength, and he sinks rapidly.

**Treatment.** — Pleurisy has been divided for description and treatment into three stages, following the natural events of the inflammation. The first stage comprises the period from the first onset to the time when effusion commences. The second stage, or stage of effusion, extends to the time when the liquid begins to diminish; and the third stage consists of the period occupied by the absorption of the liquid.

Should the quantity remain stationary or diminish very slowly after the lapse of two or three weeks, the disease becomes chronic.

The indication for treatment during the first stage is to arrest the progress of the disease, to diminish its intensity, to limit the amount of morbid products, and to relieve suffering.

If the patient is robust, has a hard, frequent pulse, accompanied with extreme pain and fever, blood-letting is indicated. The abstraction of ten to fifteen ounces of blood will give great relief and diminish the intensity of the attack; but if the patient is not seen early, and is of a feeble constitution, some other measures should be



substituted for it. The mass of blood may be lessened by saline cathartics, such as the sulphate of magnesia, or the bitartrate of potash in combination with jalap.

The effect of a full dose of Epsom salts is equal to the abstraction of a pint of blood from the system. Depletion is obtained this way without the impoverishment of the blood.

The frequency and force of the heart's action may also be affected by the nauseant sedatives, such as tartarized antimony and ipecacuanha, and by the direct sedatives, such as the tincture of aconite and of veratrum viride; therefore, if blood-letting is contra-indicated, the first thing to be done is to give the sulphate of magnesia, and follow it with some diaphoretic like (130), to alleviate the painful stitch in the side and to tranquillize the system.

It is well to administer salicylate of soda in 10-grain doses every three hours till a little ringing is heard in the ears, then once in four hours. This drug increases the action of the skin and kidneys and overcomes the rheumatic element present in most if not all pleurisies. The diet should be dry, all liquids being excluded, that the abstraction of water from the chest may be favored.

Nothing gives so much and such immediate relief to pain as a subcutaneous injection of morphine. Aconite also is a valuable sedative in this stage. It may be given in half or whole-drop doses every fifteen minutes for two hours; then afterwards a drop, to be repeated hourly till some impression is made upon the heart's action. Smaller doses are to be given if the pulse becomes feeble.

In the second stage, if the acute symptoms have yielded to treatment, as they usually do, the object of treatment is to promote the absorption of the fluid. This is done by the judicious use of saline cathartics and by diuretics, for the bowels and the kidneys are the natural pumps of the system.

The application of counter-irritants is also of use for this purpose, such as the tincture of iodine, and small blisters, which are to be allowed to remain on till vesication, and then the blister is to be dried up and a new one applied. If at any time during this stage the effusion is rapid and excessive, so as to endanger life, it is to be drawn off by puncturing the chest between the fifth and sixth ribs on the side with a small trocar, and the fluid is to be drawn off by suction.

Convalescence commences when the liquid begins to be absorbed; and active medication should then cease, and that course should be pursued which will lead to the restoration of the general health. This is done by tonics, a nutritious diet, and other hygienic means. If the effusion ceases to be absorbed or the process takes place very slowly, then that state of things exists which is called chronic pleurisy. Then the main objects of treatment are to effect the removal of the fluid, and to develop and sustain the powers of the system. Under these circumstances, it is better to discontinue remedies which act upon the bowels and kidneys, at least for a time, and try general

treatment. This consists of tonics, stimulants, and general exercise in the open air, and with this the surgical removal of the fluids from the cavity of the chest.

The operation is now so much improved, and is so safe and simple and attended with so little pain, that it has become an every-day practice, and an operation which was only resorted to as an extreme measure to save life, is now admissible whenever the pleural cavity remains filled with liquid, after only a brief trial of the remedies assigned to promote absorption.

### Lung Fever. — *Pneumonia*.

THIS disease, by common usage, has been called a fever; but by physicians it is reckoned as one of the *inflammations*. It is inflammation of the *lungs* or *lights*; and whatever fever there may be results entirely from this local inflammation.

For the purpose of more clearly describing this complaint, it is found convenient to divide it into three stages, or degrees of progress.

**First Stage.** — This is called the *stage of engorgement*. The lungs during this stage are *engorged* or *crowded* with blood. If we could inspect them, we should find the inflamed portion *redder*, *thicker*, and *heavier* than usual. We should find them weaker, that is, more easily torn than in the natural state; with less air in them, and consequently crackling less upon pressure, — yet not entirely destitute of air and crackling, and not so heavy as to sink in water. Rapping upon the chest at this period gives out a flatter, duller, or less hollow sound than usual. On applying the stethoscope, we hear less of the natural *rustling* sound of health; and, either mingling with, or overcoming it, we hear a minute *crackling* sound, as the air passes in and out in breathing.

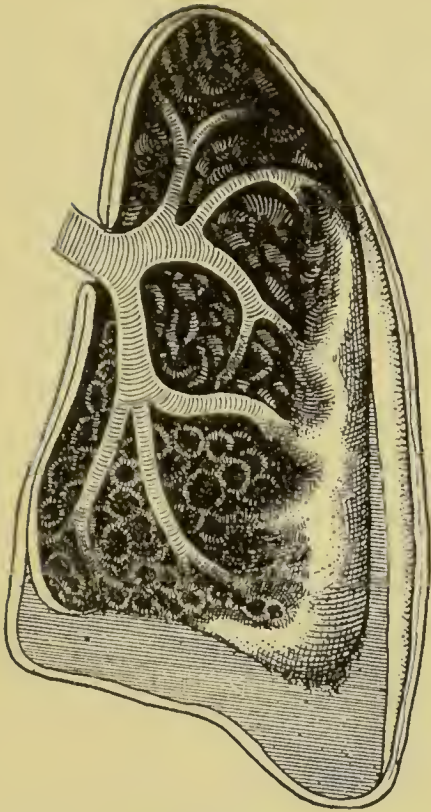
This crackling has been compared to that produced by fine salt thrown upon red-hot coals; or by that of rubbing a lock of fine hair between the thumb and finger near the ear. It is caused by small bubbles of air being forced along the moist and sticky sides of the small tubes and air-cells. It is heard only while the breath is being drawn in.

**Second Stage.** — If the inflammation advances to the second stage, the swelling of the diseased lung increases so as to force out the air entirely, and it becomes *solid*, and wholly useless for the purpose of breathing. In solidity and general appearance, it resembles a piece of liver. Hence it is said to be *hepatized*, or *liverized*; and this is called the stage of *hepatization*.

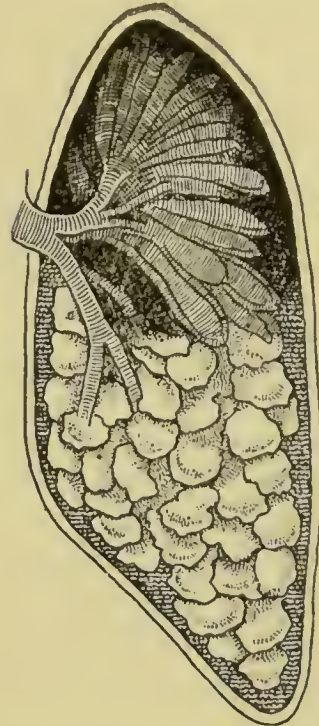
As the lung grows more solid, its vitality and strength diminish; it is not near as strong as a piece of healthy liver, though it looks like it; it is soft and easily broken; indeed it seems to be in a state of commencing decay or rottenness. Hence some writers, in order to be more precisely correct, call this the stage of *red softening*.



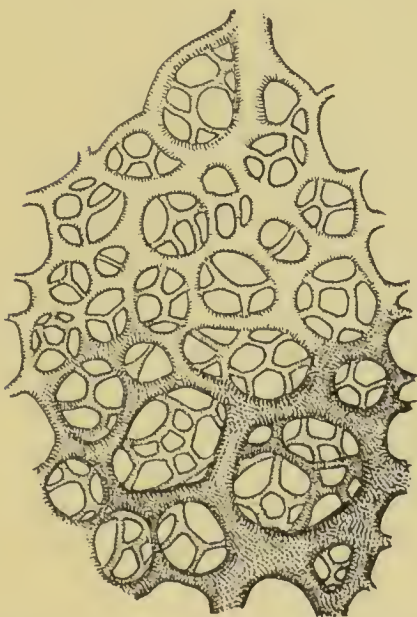
## Lungs and Their Diseases.



State of the Lungs in Pleuro-Pneumonia.



State of Lungs in Consumption



A portion of the tissue of the Lungs showing Blood Vessels, Capillaries and Air Tubes—magnified 50 diameters.



Consolidation of Lungs in Vesicular Pneumonia.

For healthy condition of Lungs see Manikin.





With increased solidity, there is of course increased dullness on percussion. When the stethoscope is applied to the chest, we hear no sound of air passing into and out of the diseased lung; no natural rustling, or minute crackling; but in their stead, we have a kind of whistling, produced by the air passing back and forth in the wind-pipe and its branches, but finding no entrance into the solidified air-cells. The breathing sometimes sounds like a sort of puff, — owing to the column of air rebounding when refused admission to the closed-up cells.

The general symptoms now increase in severity. There is greater difficulty of breathing; the phlegm is more gluey; perhaps some delirium shows itself; and the patient grows weaker.

**Third Stage.** — At this period, the lung changes from *red hepatization* or *red softening* to *gray hepatization* or *gray softening*, and matter is now found diffused through its whole substance. The percussion sounds are much the same as in the second stage. On listening, we hear more of the rattling sound produced by disturbed phlegm. The matter raised is thinner, — more like liquid; and looks like prune-juice. The symptoms generally indicate that the patient is sinking. Patients may recover from the first and second stages, but rarely from the third.

**Symptoms.**—For several days before the disease is pronounced enough to make the patient appear very sick there is a general discomfort of the principal air passages, especially the nose and throat, in fact, a great many cases of pneumonia follow a so-called cold, which has been present for two or three weeks. In others, and in this disease perhaps the first symptom to be noticed is a chill, mild or severe, which has no influence upon the severity of the disease that is to follow. Following this chill comes the fever and usually the so-called pluritic pain over some portion of either lung, many times it appears to be over the nipple of the side affected, or it may appear in the lower chest or even in the back. Shortness of breath caused by the pain when a deep inhalation is attempted then appears, and though the pain in the chest may diminish, which is frequently the case, fever and shortness of breath continues; the appetite leaves, thirst appears to a greater or less extent, the bowels are usually sluggish, the flush shows on the cheeks and a distressed, hacking cough, suppressed if causing too much pain, and the raising of a scanty, dark reddish phlegm, which, when expectorated into a vessel has a tendency to stick to the sides, and does not flow freely like saliva. The disease rapidly assumes a severe condition, and in favorable cases remains about the same for five to eight days. During these days mentioned, the so-called crisis occurs, which is the sudden dropping of the temperature from 102 to 104 at which height it has been, down to the normal, which is  $98\frac{1}{2}$  degrees. The respiration during these times is rapid and short. The sickness of the patient progressively increases the

pulse which is around 100 to 130. The mind is many times clouded, especially in children or those addicted to liquor.

**Treatment.**—It is well to understand that in this most serious disease the best care and maintenance of strength is absolutely required. There are a certain number of cases that will die in spite of the best treatment that can be obtained, another number will get well if not given the wrong treatment or neglected, but a large middle class between these two extremes will need careful treatment to carry them through to recovery. There can be no absolute routine treatment in pneumonia, as the condition of the patient will demand how much stimulation is needed and what degree of lung tissue is affected. In the early stages of pneumonia, some depressant to the increased circulation which will be seen by the rapid beat of the pulse, is needed, a tincture of aconite or of veratum viride in one drop doses repeated every half hour until five or eight doses have been given. Although the temperature will be increased at this time, a hot mustard foot bath will help the aconite in its action and relieve temporarily the congestion of the lung. If violent pain in the chest, due to pleurisy is present, small doses of Dover's powder which may be obtained at drug stores and which consists of ipecac which is a sweat producer, and morphine which is a pain quieter, and the combination of these two, act most happily upon the system in this condition. Thus 5 to 10 grains of Dover's powders repeated if the pain continues, every three or four hours will often give great relief. This remedy must be used only during the first two or three days, as later on they will only tend to further depress the heart, which may by this time be showing the effect of the disease. It will now be necessary to see that the eliminating organs of the body, such as the bowels, the kidneys and the lungs are kept in a state of active work; an expectorant such as the prescription recommended under bronchitis consisting of chloride of ammonia, citrate of potash and licorice mixture will enable the patient to raise the phlegm and the citrate of potash will exert a favorable action of the kidneys. It then remains for us to keep the heart in as good condition as possible, care being taken not to over-stimulate as the chances are good for all the stimulants we possess to be needed before the patient is through the crisis. This is done by the use of strychnia, the most favorable and digitalis and alcohol in the form of whiskey and brandy in the order named. Strychnia may be given on the second and third days, or if not needed then, when the acceleration of the pulse to above 110 renders it necessary. The dosage may be at first 1-60 of a grain four times a day; when this dose ceases to hold the pulse at 110 the dose may be increased to 1-40 of a grain every four hours, and even later again increased to 1-30 or even 1-20 of a grain, but of course, these later doses *only on the advice of the physician who has*



*taken charge of the case.* Whiskey or brandy in tablespoon doses for adult every four to six hours will be of temporary service in tiding the patient over attacks of heart failure. Digitalis in the form of tincture given in doses of 10 drops three, four or five times during twenty-four hours may be needed after the third, fourth or fifth days. The fever will often rise to 103 or 104 degrees and remain at this point, but as the disease will turn sometime between the fifth and eighth or ninth days we do not have to use strenuous measures to reduce the fever unless the patient is very nervous or delirious. In this latter case tepid or cool water sponging will often relieve the nervous troubles by reducing the fever and enabling the patient to sleep without artificial aid. A jacket made of sheet-wadding and kept about the chest is a good precaution if constant care of a nurse is not given. This will often tend to reduce congestion and surely keeps the chest from exposure to changes in temperature, should the patient throw off the clothes. In emergencies which may occur at any time during the course of the disease and to be watched for especially at the crisis or turn of the disease, the aromatic spirits of ammonia in half teaspoonful doses diluted with water may be given every hour for the stimulating effect. Oxygen is often of value though many times used without effect. It will quiet labored breathing to some extent and supply the blood with a necessary article which the consolidation in the lung is withholding from it. As soon as possible withdraw what unnecessary stimulation is being given and through the convalescence give the expectorant mixture and nourish well with eggs, broth, milk and light but concentrated articles of diet.

### **Typhoid Lung Fever. — *Typhoid Pneumonia.***

THIS is an inflammation of the lungs, differing from the preceding only in the character of the fever attending it, which is of a low, typhoid character. The disease, like typhoid fever, is characterized by great debility and prostration.

**Symptoms.** — These are a combination of the symptoms of pneumonia and of typhoid fever. The disease begins with great weariness, lassitude, dizziness, pain in the head, back, and limbs. Soon there is much difficulty of breathing, tightness across the chest, with a dry, short, hacking cough.

As the disease advances, the active symptoms pass away; there is a dull pain across the chest; drowsiness is very apt to come on, with the various symptoms of sinking peculiar to typhoid fever. The skin is harsh and dry, the temperature uneven, the tip and edge of the tongue red, and the middle covered with a yellow or brown fur. The bowels are tender, swollen, and drum-head like; while there is often a diarrhoea, — the discharges having a dirty-yellow color.

**Treatment.** — This should be like the treatment of pneumonia and typhoid fever united.

Great care must be taken not to use *reducing* remedies. While active purging must not be used, yet, if there are symptoms of an inactive state of the bowels, podophyllin and leptandrin (34), (39), may be employed with advantage.

When there are symptoms of great depression, use tonics (46), (48), (50), (53), (60), (64), (67), (73), taking care to keep the cough loose by flaxseed, slippery elm, and marshmallow tea, and by some external irritant.

### Broncho-Pneumonia.

THIS is an infectious inflammation, characterized by an exudation from the blood-vessels, the formation of new connective tissue, and the growth of bacteria. The disease involves the walls of the bronchi and the air-spaces surrounding the inflamed tubes. It is frequently called capillary bronchitis and catarrhal pneumonia. It is the ordinary pneumonia of children, and is frequently seen in young people.

It comes on primarily, but is often secondary to measles, whooping-cough, etc.

**Symptoms.** — In the very young, the only symptoms are fever, prostration, and rapid breathing. There is no cough, no physical signs, but the disease is, almost always, fatal within a few days' time.

There is a great difference in the invasion of the disease in different cases, the severer cases being ushered in by one or more convulsions, by rapid rise of temperature, vomiting, difficulty in breathing, and delirium; the milder cases beginning with lower temperature, moderate prostration and shortness of breath.

The height of the temperature is, as a rule, in proportion to the severity of the disease. Temperatures of 105° and over are usually fatal. The pulse reaches 150 to 170 in adults, and even higher in children, — so high, in fact, that it cannot be taken. The respiration varies from 40 to 80. Sleeplessness, restlessness, and even delirium are frequently present. The face is flushed, the tongue coated, and oftentimes diarrhœa and vomiting occur. Cough is usually present, and in the young the sputum is swallowed. The urine is frequently albuminous and contains casts.

Between the second and fifth days the signs of consolidation and pleurisy appear, i. e., dullness on percussion, bronchial breathing and bronchophony with crepitant rattles.

The duration of the disease in children varies: of the fatal cases the majority die within the first fortnight. The cases which recover vary from one to three weeks, though many persist for six and eight weeks. The softening and absorption which occurs in all pneumonias that recover occupy a much longer period in broncho-pneumonia than in lobar pneumonia.

Many cases of broncho-pneumonia are complicated by *cerebral* symptoms of convulsions, delirium, stupor, vomiting, etc., even before



any marked lesions in the lungs appear; as these subside the lung symptoms appear. Many cases are protracted for a long time, and though they may terminate favorably at last, yet they are apt to run into a chronic hardening of the lung which lasts for years; or they recover with a permanent consolidation of the lung. Some die of exhaustion.

**Treatment.** — The use of hot fomentations and poultices over the chest and the administration of small doses of ipecac and aconite at short intervals soothe the bronchitis and pain.

For the cerebral symptoms, phenacetin and the bromides are very useful. Aconite and digitalis are usually employed when the pneumonia stage comes on. As a rule stimulants are not required in children, in whom the disease most frequently occurs.

In convalescence, iron, quinine, cod-liver oil, oxygen and a change of air are to be recommended.

### Other Forms of Lung Inflammation.

OF the various other forms of lung inflammation which occur, mention may be made of pneumonia dependent on Heart Disease; Interstitial Pneumonia, or the formation of new connective tissue and obliteration of the air-spaces; Tubercular Pneumonia, which is caused by the presence of tubercle bacilli; Acute and Chronic Miliary Tuberculosis, characterized by the presence of numerous minute nodules called miliary tubercles; Acute and Chronic Tubercular Consumption; Gangrene of the Lung, where a portion of the lung has lost its vitality and the germs of putrefaction have entered.

### Asthma.

Asthma may be defined to be great difficulty of drawing in the breath, — coming on suddenly, sometimes gradually, — accompanied with a sense of extreme suffocation, and a desire for fresh air; continuing for a longer or shorter period, and then passing away, and leaving the patient a period of comparatively easy respiration.

**Symptoms.** — There are sometimes no premonitory symptoms, the attack coming on suddenly, and without warning; but more frequently there are, for some days before the onset, loss of appetite, flatulence, belching of wind, irritability, languor, chilliness, oppression, and drowsiness. The hard breathing generally makes its appearance in the night, — quite often at three or four o'clock in the morning, when the nervous system is at its lowest ebb. There is first a sense of tightness, or stricture, across the chest, which seems to expand with difficulty. The patient can no longer remain lying down; he rises up, draws up his knees, and, leaning forward, puts his elbows upon them, and his head upon his hands, and then struggles hard to draw in his breath; which, passing in slowly and

laboriously, produces a loud wheezing sound. Sometimes he feels that he must have fresh air, and, rushing to a window, puts his head far out, to catch a stirring breeze. The hands and feet are cold, the face haggard and distressed, — sometimes a little red and swollen, but more generally pale and shrunk, — the body wet with perspiration, the pulse irregular, feeble, and small, though sometimes not disturbed. These symptoms continue for some hours, more or less, when the breathing becomes more easy, and there is a little phlegm raised, sometimes considerable. This cessation of difficult breathing may be complete, or only partial; and lasts for a longer or shorter period, when the attack again recurs.

**Causes.** — It is well known that Asthma has its cause mainly in the nervous system. The air-tubes are encircled with a series of little bundles of fibres, which are, in fact, muscles, and like all other muscles have the power of contracting or shortening themselves. These muscles, too, like all others, have nerves distributed to them; and when these nerves become diseased or irritable, they will become disturbed on certain occasions, and cause these small, circular puckering strings to contract and close up the air-tubes near their terminations, very much as the puckering-string closes the mouth of the work-bag, so that very little air can pass into the air-cells, and that little with great difficulty and slowness. When these contractions take place, and the air is thus shut off, the result is a fit of asthma. This disease may be brought on by any of those states of the atmosphere which disturb or irritate the bronchial surfaces, or by any of the numerous causes which mysteriously unbalance the nervous system. A fit may be brought on by whatever disturbs the mind.

In addition to this cause which is known as the bronchial type of asthma there are the cardiac and nephritic types. The so-called cardiac asthma, in the early stages is perhaps more amenable to treatment than the bronchial type but its course would not be effected by the drugs given for the latter type and appropriate remedies for the heart must be given. In the nephritic type the asthma is due to the retention in the system of the poison which is prevented from passing out of the body in the urine because of disease of the kidneys.

**Treatment.** — The disease has been regarded as extremely difficult of cure. There are certain remedies, however, which have a remarkable control over it, and, if skilfully used, will frequently bring it to a complete termination, and, even in the worst cases, to a state of very great mitigation and improvement.

*Inhalation.* — The most important and certain remedy is the use of the Alterative Inhalant, described on page 273. I have with this article alone effected some surprising cures; yet it is well to combine



other treatment with it. I have had several cases of a most distressing character, — the attacks continuing night and day, — in which the inhalation, judiciously administered, has caused the disappearance of the complaint within twenty-four hours, and in which no return of suffering has occurred for several weeks, and then only in a modified form. This remedy should be used four or five times a day.

Iodide of potassium is a most valuable internal remedy in this complaint; indeed, in a certain sense, it is almost a specific. It should be used (prescriptions 101, 138, 140, 151) at the same time with the inhalation. The following preparation is a very good remedy for this disease: Ethereal tincture of lobelia, two ounces; tincture of asafoetida, one ounce; grindelia, one ounce; iodide of potassium, two ounces; simple syrup, four ounces. Mix. Dose, from a teaspoonful to a tablespoonful, every hour or two.

Several other remedies are used for asthma, with more or less success, such as electro-magnetism, smoking stramonium leaves, burning paper dipped in a strong solution of nitrate of potash, and inhaling the smoke, etc., — but none of these have as much value as the two remedies first named.

For the cardiac type strychnia, digitalis, spartine, strophanthus and cocaine in appropriate dosage must be given to effect an improvement. For the kidney type relief of the system by other channels than the kidneys, until they are in better working order will be necessary. This can be accomplished by the use of saline cathartics such as one or two teaspoonfuls of epsom salts diluted with water, given often enough to cause two or three watery discharges during twenty-four hours. In addition to this sweating of the skin by means of hot lemonade or small doses of Dover's powders in hot drinks may be given.

In as grave a complaint as a severe case of asthma, it is always well to seek the aid of a physician.

### Hay-Asthma. — Hay-Fever.

THIS is a very troublesome complaint, which seems to combine the peculiarities both of asthma and of influenza. Fortunately, it attacks but few persons, and those only at particular seasons of the year, — namely, while hay is in blossom, and during hay-making.

**Symptoms.** — These are a combination of the symptoms of the two diseases above named. There is great irritation of the eyes, with sneezing, and a free discharge from the nose. There is tightness across the chest, difficulty of breathing, and a pricking sensation in the throat. These symptoms often appear in great severity, making the complaint a really distressing one.

**Cause.** — This disorder appears to have but one cause, — namely, some sort of emanations from the grasses, flowers, etc., while in blossom; which emanations come in contact with the mucous lining of the eyes, nose, and throat, producing very great and teasing irritation.

**Treatment.** — One of the best remedies for this troublesome complaint is to avoid the cause, by removing, during the flowering and haying season, to some large city, or, still better, close down to the seashore, where flowers and hay do not grow.

Of medicines, the tincture of lobelia, taken in moderate doses, is a very good remedy. Quinine and iron, given in combination (75), are valuable preparations. Strychnine and nux vomica, in connection with iron or otherwise (316), (83), (84), (85), (86), (95), are very useful. Iodide of potassium (101), (138), (140), is also worth a trial. Another very good remedy is the chloride of lime, or the chloride of soda, placed in saucers about the sleeping-room. Pieces of cotton cloth may also be dipped in one of these solutions, and hung about the apartments of the house. The hands and face may likewise be washed, once or twice a day, in a weak solution.

The oxide of zinc and the extract of nux vomica, made into pills, two grains of the zinc to half a grain of the extract to each pill, and one pill taken morning and evening, should not be forgotten.

Of late cocaine, painted by means of a camel's hair brush on the mucous membrane of the nose, has been used to check a paroxysm and mitigate the disease.

The following formula is the most efficacious of this class of remedies and should be painted onto the nasal mucous membrane as high up as possible; its use may be repeated several times till the membrane becomes numb.

Cocaine . . . . .	12 gr.
Antifebrin . . . . .	25 gr.
Alcohol . . . . .	1 dr.
Simple Elixir . . . . .	3 dr.

Mix and shake before using.



















